THE

FARMER's DIRECTOR;

OR,

A COMPENDIUM

OF

ENGLISH HUSBANDRY, &c.

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THE

FARMER's DIRECTOR;

OR,

A COMPENDIUM OF ENGLISH HUSBANDRY.

CONCISELY DESCRIBING

The Management of Land, and Cultivating the ſeveral Kinds of Corn and Pulſe.

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Of Meadows and Paſtures, and a new Syſtem of applying the Graſs-Lands of a Farm.

With various Improvements interſperſed through the Work.

ALSO

AN APPENDIX.

CONTAINING

General Obſervations and Directions on various Subjects of Huſbandry.

SUCH AS

Difference of Soils, and the Manner of treating them.

Of the Cattle neceſſary for different Farms.

Of the Improvement of Heath Lands and Marſhes.

Of the Manner of improving a new Farm.

Of the Servants neceſſary, and the various Implements of Huſbandry.

Of the Expence of Stocking, &c. &c.

BY THOMAS BOWDEN,

OF THE COUNTY OF KENT.

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CONTENTS.

Page
INTRODUCTION — 1

CHAP. I.
Of Fallowing — 15

CHAP. II.
Of Wheat — 21

CHAP. III.
Of Rye — 34

CHAP. IV.
Of Barley — 36

CHAP. V.
Of Oats — 39

CHAP. VI.
Of Beans — 44

CHAP. VII.
Of Peaſe — 49

CHAP. VIII.

Of Vetches — — — 52

CHAP. IX.

Of Buck or French Wheat — 54

CHAP. X.

Of Clover — — 55

CHAP. XI.

Of Ray Graſs ——— 61

CHAP. XII.

Of Sainfoin — —— 63

CHAP. XIII.

Of Lucerne — — 72

CHAP. XIV.

Of Burnet ——— 80

CHAP. XV.

Of Turneps —— — 83

CHAP. XVI.

Of Cabbages ——— 93

CHAP. XVII.

Of Carrots and Parſneps — 104

CHAP. XVIII.

Of Potatoes ——— 109

CHAP. XIX.

Of Manures — — 114

CHAP. XX.

Of Food for Cattle — — 121

APPENDIX.

CHAP. I.

Of different Soils, and the Manner of treating them — — — 129

CHAP. II.

Of the Cattle neceſſary to be purchaſed for a new Farm. — 134

CHAP. III.

Of the Improvement of Heath Lands and Marſhes — — 137

CHAP. IV.

Of the Manner of Cropping and Improving a new Farm — — — 141

CHAP. V.

Of improving by Tillage without Manure 145

CHAP. VI.

Of Flax and Hemp — 148

CHAP. VII.

Of Sheep Walks on a new Farm 152

CHAP. VIII.

Of Servants neceſſary for a new Farm, and the neceſſary Implements — 155

CHAP. IX.

Of the Expence neceſſary to be laid out in the Stocking of a new Farm — 158

INTRODUCTION.

MUCH has been written upon the ſubject of huſbandry, but farmers have neither leiſure nor inclination to read large volumes; and it is very troubleſome to conſult any in the form of calendars, as it is neceſſary, in conſulting a book in that form, to run over the whole, for information on each article. For this reaſon, I have put this ſmall tract into another form; and have ſtudied brevity, as much as the variety of matter would allow, ſo as to give uſeful information to practical farmers, for whom it is principally intended.

The general plans of farms are extremely various, and the modern practice of agriculture, is in many particulars different from thoſe in uſe half a century ago. Fallowing for wheat, every third or fourth year is an inſtance of this, which formerly was thought neceſſary to refreſh the land, and make it clean from weeds, for theſe purpoſes a change of crops is now ſubſtituted; a crop of turneps, clover, &c. is now obtained in the fallow year, and the expence of fallowing ſaved, which is a very valuable improvement.

One of the principal means of obtaining this advantage, is hoeing; a method of tillage formerly

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merly little known; the practice then being to prepare land for a crop by only ploughing and harrowing, and the tillage all performed before the ſeed was put into the ground; but hoeing is done afterwards, either by hand or by horſes, the benefit of which is very great: For it not only deſtroys weeds, but alſo improves both the crop and the land. A hoed crop of beans is now reckoned a fallow crop; the crop of beans is greatly improved by it, and the land is made clean; and ſo much enriched by the hoeing, that wheat, or any other crop, may immediately ſucceed with good ſucceſs, and with much leſs manure than is neceſſary when the beans are not hoed. This is known to many farmers, but the cauſe is known only to a few.

Some attribute this enriching effects of hoeing to its deſtroying weeds, which it certainly does; but this is not the only cauſe: For clean land, which has none or very few weeds in it, is alſo enriched by hoeing, as plainly appears in the ſucceeding crop. Others think that hoeing enriches land, by dividing and opening, or pulverizing it; and no doubt, this tillage, which makes the land light and fine, opens new paſſages in it, for the roots to ſpread, and collect nouriſhment for the plants, and is a great means of improving the crop then growing upon it; but this does not enrich the land for the ſucceeding crop; but on the contrary the more nouriſhment the preſent crop receives, the leſs of it will remain for the next crop: And if the land was not enriched by ſome other means, the repeated ploughing and hoeing year after year, would make it ſtill poorer, which is contrary to experience; and therefore we muſt conclude, that land being exhauſted by yielding repeated crops, muſt be recruited elſewhere: Since it is certain that tillage, or the mere dividing of the earth, by ploughs or hoes, adds no more matter to it; without which a repetition of crops would very ſoon exhauſt and impoveriſh it.

The earth is ſurrounded by a fluid body, called the air, or more properly the atmoſphere, which contains in it all the principles of plants, and of other bodies: And as the ſurface of the land is expoſed continually to the action of the ſeveral kinds of matter contained in the atmoſphere, they muſt have a very great effect upon it: For from thence comes heat and cold, drought and moiſture; air, dew, rain, ſnow, and froſt; theſe together with the cheriſhing influences of the ſun, are powerful agents, and in fact we ſee the great effects they have upon land, that lies immediately expoſed to them. The rain ſinks into the land, through which it is filtered, and leaves behind ſome of the enriching particles contained in it; and land made fine by good tillage, ſucks in the dews like a ſpunge. Theſe, with a proper degree of heat, revive the drooping plants, that have been too much dried by heat, or checked by too great a degree of cold. Nothing is plainer to the obſerving huſbandman, than the effects of theſe upon his crops, which cannot thrive without their continual influence; and this influence is not barely a name, but means that ſome kind of matter is communicated to the land, whereby it is enriched, and made capable of nouriſhing the crops that grow upon it.

I do not pretend to deſcribe what kind of matter it is, by which plants are nouriſhed; and whether it conſiſts of only one, or of various kinds of matter. This is a curious queſtion, not well reſolved by the learned, nor neceſſary for the huſbandman to know: It is ſufficient to ſay here, that the earth is ſupplied with the food or nouriſhment of plants from the atmoſphere; and which appears to be the principle, if not the only ſource of that nouriſhment. The land requires to be frequently opened by tillage, to render it capable of receiving this nouriſhment from the atmoſphere: For if not tilled, it ſettles downwards by its own weight, and becomes ſo compact and cloſe, that the air and dews cannot penetrate deep into it, eſpecially into ſtrong heavy land, into which it penetrates but a few inches next the ſurface only; and ſo far as they do penetrate, the land has ſomewhat a different colour, (from the earth below) and is called the ſtaple of the land; which is richer than the earth that lies under it.

The cloſeneſs of ſtale ground prevents the enriching particles in the air from penetrating deep into it: But they enter more eaſily into a ſoil opened by tillage, eſpecially near the ſurface; for this reaſon land is much benefited by hoeing, for that changes and expoſes a new ſurface to the atmoſphere every time it is hoed; and hoeing enriches land in a much ſhorter time than if it continued at reſt: for while at reſt, the land is enriched only near the ſurface; but when ſtirred and turned by the hoe, the ſeveral parts are brought to the ſurface, in turn, by the repeated hoeings; and thus the whole ſtaple of the land is impregnated with the nutritious particles of matter from the atmoſphere.

By this it appears, that enlarging the ſurface of land will be a means of enriching it; and it is found by experience, that laying land up in ridges, which enlarges the ſurface of it, enriches it more than laying it flat. This is proved in a remarkable manner, when it is laid up in narrow ridges, and hoed with a plough; a method of tillage known by the name of the New Huſbandry: For by frequently ploughing the earth, from and to the ridges, the land is ſo mellowed, and brought into ſuch fine tilth, and the ſurface ſo often changed and enlarged, that the air and dews have a free entrance into every part of it; and every part of it is enriched to ſuch a degree, that wheat has been cultivated in this manner for many years, upon the ſame land, without intermiſſion; and has produced good crops every year upon ordinary land, without reſt or manure; which plainly proves, that land well tilled, and the ſurface of it enlarged, and frequenttly changed, is enriched by the atmoſphere in ſo high a degree, that even wheat crops, taken from it every year, do not impoveriſh it: On the contrary, it becomes richer by this tillage and hoeing; and has been found ſo after a trial of ſeven or eight, to more than twenty years.

Common hand-hoeing with the Kentiſh ſhim, and other ſuch inſtruments, are all improvers of land, in proportion to the depth they go in it, the enlargement of the ſurface, and the frequent repetition of ſuch hoeings; but none of them improve it ſo much, as this method of laying the land in ridges, and repeated and deep horſe hoeings with the plough. I will not however be underſtood to recommend this method of cultivating wheat to every farmer, till he has experience in the horſe-hoeing of other plants, as turneps, cabbages, &c. in ſingle rows, and others in double rows, and till he has tried it with wheat, in ſmall experiments, after which he may ſafely proceed to larger; and he will find upon full experience, that good wheat land, ſkilfully cultivated in this method, will be more profitable to him, than in the common huſbandry; not in reſpect of the crops being larger than common, but becauſe the horſe-hoeing method is by much the cheapeſt, and has the advantage in ſome other reſpects.

One reaſon that the hoeing huſbandry produces good crops, without dung or other manure, is, the wheat is nouriſhed from its infancy to maturity progreſſively, as nature demands; but wheat that is ſown broad caſt, has a large ſtock of proviſion laid in for it all at once, and none afterwards: For the land is prepared for it by fallowing, or repeated ploughings, and plentifully dunged or manured; but after the wheat is in the ground, it generally receives no more aſſiſtance, except perhaps a weeding, when the weeds have nearly finiſhed their growth, and have almoſt done robbing the wheat of its nouriſhment. The land being thus exhauſted by a double crop, a crop of corn and one of weeds, and the virrue of dung declining daily, the crop has the leaſt benefit when it is grown large, and ſtands moſt in need of it; and hence ſo many ſmall under ears in a common crop of ſmall, ſtinted, half-fed ears and grain, whereof too many broad caſt wheat crops conſiſt, in conſequence of a deficiency of nouriſhment as they advance in growth: Whereas had not the virtue of the tillage and dung been waſted, while the crop was in its infancy, there is no doubt but leſs would have ſufficed to nouriſh the crop, had the nouriſhment been given to it gradually, as it had occaſion; and this is confirmed by the health and vigour of the hoed crops, which have not ſo large a ſupply of nouriſhment at firſt, but more afterwards, when they ſtand in moſt need of it.

Land exhauſted by crops, is again reſtored by means of reſt, fallowing, change of crops, and manure. Farmers are apt to depend too much upon manures, dung in particular, to enrich their land: For though dung is of great efficacy in that reſpect, it is in ſeveral caſes hurtful to the crop, and always expenſive; for which reaſon the farmer ſhould not place his principal dependance upon dung, but rather as an aſſiſtant to tillage; and in that way it will be of great uſe to him.

One of the principal effects of dung, appears to be its raiſing and keeping up a fermentation in land, whereby it is reſolved or divided into ſmall parts, and prepares the land to receive the vegetable nouriſhment from the air; tillage has alſo this effect in a degree that is beneficial to plants: Whereas much dung being laid upon land at once, has a more ſudden and often too violent an effect at firſt, and ſhould therefore be uſed with caution.

Many different things are made uſe of as manure, the dung of horſes, black cattle, ſheep, hogs, and of all other kinds of animals; the blood, fleſh, hair, and all parts of animals: and plants of all kinds ploughed into the land, while green and in ſap; as clover, peaſe, buck-wheat, and others, which make good dreſſings for land; and the parts of plants, as ſaw duſt, bark, leaves, malt duſt, rape cakes, ſea ſhells, ſea weeds, and others; likewiſe mixtures of different earths are very beneficial to land; marl of ſeveral ſorts, chalk, &c. theſe laſt are of great uſe, and ſo are mixtures of earth of different qualities, ſand laid upon clays, and clays, or other ſtrong earths, upon ſandy light ſoils. The oppoſite qualities of manures to the land, and to each other, all contribute to excite an inteſtine motion or fermentation in the land, to reſolve it into very ſmall parts, which prepares it to receive the enriching dews, and other benefits from the atmoſphere. That this is one effect of manures, is evident from the ſwelling and crumbling of land that is dreſſed with them.

Manures have not their full effect upon land unleſs they are reduced to ſmall parts. Chalk or marl laid upon land in lumps or large pieces, are of little uſe till they are broken fine, mixed, and incorporated with the fine parts of the ſoil; for which reaſon, all ſorts of manure ſhould be made as fine as poſſible, and laid on evenly, that all parts of the land may be equally improved by it; this is one reaſon that ſheeps dung is of ſo much benefit to land; it is of itſelf a rich manure, conſiſts of ſmall parts, and it is ſpread upon the land equally by folding. Powdered manures have for the ſame reaſon a good effect, and many of them a ſudden one, as aſhes of ſeveral ſorts, ſoot, pigeons dung, alſo ſhells pounded, and pot-aſhes in powder. And compoſts are preferable to dung alone.

Huſbandmen are at a great expence in rent, and in cultivating their farms, which uſually conſiſt in arable land, meadows and paſtures, commons, heaths, downs or ſheep walks, and wood for fuel, and repairs of their inſtruments of huſbandry, &c. The leaſt expenſive of good land is meadow, and generally eſteemed the moſt profitable, though higheſt rented.

The chief produce of this land is hay, which near great towns bears a high price; yet are the crops ſubject to ſeveral caſualties, that are a conſiderable abatement in the value of ſuch land. Some meadows are mowed twice in the ſeaſon, which much impoveriſhes them, and renders a good dreſſing of manure neceſſary every ſecond or third year at leaſt.

In every meadow there are various kinds of graſſes, which arrive at maturity at different times in the ſeaſon; hence a difficulty ariſes in regard to the time of mowing; if mowed late, the farmer may obtain a large crop, but that advantage may be loſt in the ſcantineſs of the ſecond mowing; and what is ſtill of more conſequence, the ſeaſon will be ſo far advanced for mowing the latter crop, that it will be in great danger of receiving damage by rain before it can be thoroughly made; ſo that upon the whole, early mowing is the beſt huſbandry: and to bring the land in order for early hay, it ſhould be well dreſſed with warm manures.

It is to be ſuppoſed that meadows intended for hay, have been rolled in the ſpring, in order to lay the ſurface very ſmooth, that the graſs may be mowed cloſe to the ground, where it is always thickeſt; otherwiſe much of it would be loſt, and what was left would obſtruct the growth of the ſecond crop. As ſoon as the graſs is cut, ſeveral hands, men, women, and children, ſhould be employed, to follow immediately after the mowers, and with forks to lift up, ſhake, and ſpread the ſwarths thin upon the ground, taking care at this firſt operation, that the hay be well opened: about the middle of the day turn it with the forks, opening every lock perfectly, and ſpreading it again thin as before; and towards evening, before the dew falls, draw the hay together, and put it up into graſs cocks. Next morning, as ſoon as the dew is off the ground and hay, ſpread and turn it in the ſame manner as the firſt day, enlarging the cocks in the evening: and the third day, if the weather has continued fair and drying, it may be fit to carry and ſet up in a rick. It ſhould be perfectly dry when ricked; and though it will have a green colour, and ſap remaining in it, that will be no diſadvantage, but the contrary, provided it is perfectly dry on the outſide, and care is taken in ricking it: for if it appears to be ſtill ſo juicy, that there ſeems to be danger of its overheating and firing, this will be prevented by drawing up through the rick large baſkets, empty caſks, or ſacks filled with ſtraw, at equal diſtances; to leave open funnels in the rick, through which the ſuperfluous moiſture in the hay will be carried off, and prevent its firing; and moderate heating will much improve the hay. In order to make the funnels diſcharge the damp the more readily, cut a trench in the ground, along the middle of the rick ſtand; the trench at each end ſhould extend about a yard further than the length of the rick: then cut ſeveral more trenches, croſſing the firſt, and alſo extending further than the breadth of the rick; ſet a baſket upright upon the trenches where they croſs each other, and as the rick advances in height, draw up the baſkets which will leave open funnels at theſe places to diſcharge the ſuperfluous moiſture in the hay; the trenches ſhould be covered with ſticks laid a croſs to keep them open. When the hay has ſettled, and is cool, thatch it well at top, and ſtop up the ends of the funnels with turf, &c. All hay ricks ſhould be bottomed with faggots and bavins covered with ſtraw, to ſecure them from floods, and the damp that riſes from the ground, which without this precaution would do much damage to the hay near the bottom of the rick.

If the weather ſhould change to rain, while the hay is making, make it into very ſmall cocks, and turn them often without ſhaking or opening them. Hay cannot be made in a long continued rain; but if there are any intervals of fair weather ſufficient to dry the upper ſides of the cocks, and ſurface of the ground, take this opportunity of turning the cocks whole, laying their dry ſides upon the dry ground. Hay that is not much made, and of a green colour, may be ſaved in pretty good order, by this method of turning the cocks frequently; for when ſuffered to remain long in the ſame place, the damp ariſing from the ground does the hay more injury than even the rain.

If there is ſo much fair weather as to dry the hay well, carry and rick it directly. Cloſe attendance is neceſſary to make hay in ſuch weather; but if got up dry at laſt, it will not be wholly loſt, though turned almoſt black; for if in carrying up the rick, the hay is laid in even layers, and each layer ſprinckled with common ſalt, at the rate of about a peck of ſalt to a ton of hay; cattle of all ſorts are fond of ſalt, and will readily eat ſuch ſalted hay; which thus corrected, will well nouriſh them. Or if ſprinkling the hay with ſalt was ommitted, make a weak brine with ſalt and water, (about a handful of ſalt to a pail of water,) and with a heath broom or bruſh dipped in the brine, ſprinkle the hay with it when given to the cattle, and they will eat it with a good appetite.

Old meadows are apt to be moſſy and hidebound; and as then they produce but ſmall crops of ordinary graſs, it is uſual to break them up, and continue them in tillage ſome years, then lay them down again with graſs ſeeds; but this expence and trouble may be ſaved, and the herbage improved, by a method of modern invention, viz. by cutting the ſurface of the meadow with an inſtrument called a ſcarificator. This inſtrument conſiſts of five ſharp coulters in a frame, placed at equal diſtances, about three or four inches aſunder, and handles fixed to the frame as the handles of a plough. The ſcarificator is drawn by horſes or oxen, and the coulters cut the meadow about five or ſix inches deep, in parallel lines; which they eaſily do in ſoft meadow ground. By this operation the moſs is torn up and deſtroyed, and the roots of the graſs being cut, many new roots are produced. The land ſhould then be dreſſed with powdered manure, or with a ſuitable compoſt that is dry and crumbling, which the rain ſoon waſhes into the traces made by the coulters, and ſurpriſingly invigorates the graſs; a young growth of which is now produced, and an abundant crop. Much leſs manure than is commonly laid on for a common dreſſing is ſufficient here; and it is found that cutting firſt, and laying on the manure afterwards, makes a greater improvement than manuring before the meadow is cut. All graſs lands may be greatly and expeditiouſly improved in this manner, except ſtoney land, for in that the ſtones obſtruct the coulters, and throw them out of their work.

Meadows or paſtures that are too thin of graſs, may be thickened by mixing graſs ſeeds with a quantity of dry, powdered manure, or dry mould; which being ſown thick on the land, and buſh-harrowed, after the ſurface has been cut by the ſcarificator, the manure and ſeeds will be ſwept all together into traces, and in a ſhort time make a thick covering of graſs.

Theſe ſtoney grounds, and graſs lands in general, may be improved by the ſpiky roller; which being drawn ſeveral times over the land, the ſpikes will break and penetrate the ſurface about three inches deep; which being then manured with compoſt, and ſown with graſs ſeeds, and afterwards harrowed with a buſh harrow, the manure and ſeeds will be then drawn into the broken ſurface.

The proportion of meadow and paſture to the arable land of a farm cannot be determined, as it depends upon various circumſtances; the number of cattle to be fed, the ſituation with regard to markets, &c. and is different now from what it was formerly, many articles of food for cattle having of late years been introduced that were then unknown. In corn countries hay is very ſaleable; and corn and other productions in dairy countries. And therefore, without nicely enquiring into a circumſtance, that cannot be fixed, we ſhall rather endeavour to determine what quantity of different kinds of food for cattle may be obtained from land, with proper culture, and what proportion of theſe is neceſſary for cattle of different kinds to feed or fatten them; as a farmer well acquainted with theſe circumſtances, and the nature of his land, cannot be at a loſs what proportion of his land he ſhould allot for corn, and how much for meadow and paſture. The culture of the arable land in a farm, as it requires the greateſt attention, we ſhall treat of it particularly.

CHAP. I.

OF FALLOWING.

EVERY occupier of land ſhould be particularly careful to keep it clean from weeds; they rob his crops of their nouriſhment, and impoveriſh his land. Being natives of the ſoil, they multiply exceedingly from ſeed, from roots, and offsets. Some of their ſeeds are carried from one field to another by birds, others have down adhering to them, by which they are wafted a great way in the air, ſo that they cannot be wholly extirpated; but it is neceſſary to keep them down as much as poſſible, otherwiſe they will do great damage, as they continually do to ſlovenly farmers. It has been computed, that the damage done by weeds every year, is equal to the rent of all the arable lands in England.

Several methods are taken by farmers to ſubdue weeds, whereof the principal is fallowing. Repeatedly ploughing and harrowing of land encourages weeds to grow, and alſo deſtroys them. If therefore the land is ploughed in autum, and frequently ploughed and harrowed at all proper opportunities when the earth is dry, during the winter and ſummer following, moſt of the ſeeds of the weeds, (of which there are many in the ſtubble of all ſorts of land) will grow, and the young weeds will be deſtroyed by the next ploughing. Few farmers will be perſuaded to fallow their lands a ſecond year, which would almoſt extirpate the whole race of weeds. On the contrary, ſome content themſelves with a ſummer fallow, and do not begin ploughing the land till ſpring; others give a ſummer fallow, by ploughing the land flat three or four times; this is of little ſervice in killing the ſeeds, that are in the land, becauſe ſuch imperfect tillage does not bring foul land into fine tilth; and unleſs it is ſo, the ſeeds of the weeds in it do not grow, and therefore cannot be deſtroyed by ploughing.

The moſt effectual method of fallowing, is to plough the land early in autumn, laying it up in narrow one bout ridges, ſharp at top; and when thorough dry, to harrow the ridges acroſs, with large heavy harrows, which will pull out the roots of couch, and other rank weeds: draw theſe together in heaps and burn them, and harrow the ground again with common harrows, and lay it ſmooth and fine; this will encourage the ſeeds to grow, and the weeds will come up in great numbers; when they are about two or three inches high, plough the land up again into one bout ridges, which will ſmother this firſt crop of weeds. In about three or four weeks, or as ſoon after as the land is dry, repeat the harrowings to pull out the large weeds, and then lay the ground ſmooth to encourage a ſecond crop of weeds. Theſe operations being two or three times repeated, the land will be cleared of the roots of great weeds, and be brought into a looſe, mellow condition: as ſoon as this is accompliſhed, the ridges may be ploughed down, with a broad double fine plough, which being entered at the end of a ridge, will ſplit it in the middle at one draught, and require no more ſtrength of cattle than was neceſſary to plough half the ridge at firſt, while bound together by the ſtringy roots of large weeds. At the approach of winter, the land ſhould lie in theſe narrow ridges, to receive the benefit of the froſt; and the ſame operations ſhould be continued in winter when the land is dry; and throughout the ſummer; whereof the advantages are very great. 1. The land, by diligently purſuing this method, may be made very clean, which is of great importance. 2. The worms, ſlugs, beetles, and other inſects, which deſtroy much corn, are by the frequent turning of the ſoil, expoſed to the rooks, and other birds that uſually attend the plough, and prey upon theſe vermin, as ſoon as they are thus turned up: alſo the field mice are driven away, and their breeding prevented. 3. The land is brought into extraordinary fine tilth, even as fine as garden mould; and—4. The land thus reduced into fine mould, whereof a large new ſurface is, at every ploughing, expoſed to the influences of the atmoſphere, to the air, froſt, ſun, dew and rain, is impregnated through its whole ſubſtance with the enriching vegetable food: and upon the whole, is excellently prepared to receive the ſeed wheat. Very different from this are the common fallows, particularly where many ſheep are kept: the land is ploughed indeed three or four times, but the couch and other weeds are ſuffered to

BIBL CANT ACAD

grow to feed the ſheep, and the principal benefits of the fallowing are thereby loſt; and ſurely it is wretched huſbandry, to nurſe a crop of weeds, as a preparation for a crop of wheat. The conſequence is, a neceſſity of manuring the land commonly with farm yard dung, which contains the ſeeds of many weeds; the land by this means is made very foul, and is exhauſted by a crop of weeds, beſides the other damages done by them at harveſt, and delaying the ſtacking or houſing the wheat.

Some farmers delay fallowing till ſpring, or beginning of ſummer; and by that time, if ſtrong land, it is become ſo ſtale and hard, that no common team are ſtrong enough to break it up: and when ſix or eight horſes are put to a ſtrong plough, kept into the ground by a man leaning upon the beam, the earth is raiſed in large pieces, ſome ſhallow, and others deeper than the ſtaple; and when thus blocked up, the large pieces remain unconquerable by common rollers or harrows, and cannot be reduced, but by the aſſiſtance of alternate rain and drought, to reſolve and break the hard clods; and during this time, great part of the ſummer, and benefit of the fallow is loſt, and alſo the benefit of the autumn tillage, and winter's froſt, which are very great, and cannot in any method be obtained ſo much to the farmer's advantage, as by breaking up the land early in autumn, and to continue the tillage repeatedly, throughout the winter and following ſummer; being careful to perform this tillage when the land is dry.

It is a common cuſtom with farmers, to croſs plough their land, in order the more effectually to reduce it, and that no part may be miſſed by the plough; this may be done when it is fallowed in the above manner, in narrow ridges; but it is not ſo neceſſary as in common ploughing, becauſe theſe narrow ridges being levelled by the harrows, the new ridges made at the next ploughing, will not ſtand exactly where they did before; ſo that every part of the land will be ſtirred to an equal depth, and ſeldom any miſſed though not croſs ploughed.

Thoſe who would make the moſt of their land, ſhould be careful to give it very good tillage; ſhould plough it to a proper depth; ſhould as much as they can enlarge and change the ſurface of it, and keep it clean from weeds; theſe cannot be done better than by a good fallow, in the manner before mentioned. It is not however neceſſary to repeat ſuch fallowing every courſe, but very adviſable at the beginning of a courſe of huſbandry; and when the land is brought by that means into good tilth, and made very clean, it may afterwards be in a good meaſure kept ſo by a proper change of crops, and a good courſe of huſbandry.

Farmers differ much with regard to a change of crops: the following is eſteemed to be a good change:—1. Turneps. 2. Barley with Clover. 3. Clover. 4. Wheat. Then begin again with turneps. But whatever courſe of crops is preferred, there is one rule ſhould be adhered to, viz. that two robbing or impoveriſhing crops ſhould not be taken immediately following, but a meliorating crop ſhould immediately ſucceed an impoveriſhing one. All crops of corn, or ſuch as ſtand for ſeed, are in general reckoned to be impoveriſhers of land. And ſucculent or juicy plants, that much ſhade and cover the ground, are found to be enrichers of land; as turneps, peaſe, vetches, and ſeveral others.

A crop of turneps may properly ſucceed a fallow; but when that is intended, the fallowing ſhould not be continued later than June, or firſt or ſecond week in July; then give the land a good dreſſing with dung, or other good manure; plough it in, and ſow turneps: if ſown broad caſt, from a pint to a quart of turnep ſeed may be ſufficient, and the turneps to be well hand-hoed; this is the common method, and good crops are obtained in this way; but there is a better way of raiſing turneps, which will be taken notice of, when we come to treat particularly of cultivating theſe roots. A crop of barley with clover is to ſucceed the turneps, then clover, and laſtly wheat, as above mentioned.

CHAP. II.

OF WHEAT.

THE principal crops commonly cultivated by the farmers are the following:

Wheat,
Rye,
Barley,
Oats,
Beans,
Peaſe,
Vetches,
Buckwheat,
Clover,
Lucerne,
Sainfoin,
Burnet,
Ray graſs,
Turneps,
Carrots,
Parſneps,
Cabbages,
Potatoes,
Coleſeed,
And in ſome places,
Hops,
Madder,
Liguorice,
Saffron,
Hemp,
Flax.

Wheat is the farmer's principal crop, and a very valuable one, as it is our moſt general bread corn; and, as an article of exportation, of high importance to Britain. In favourable ſeaſons, and with good culture, it will yield profitable crops on various ſoils, but ſtrong land is moſt ſuitable to it, particularly ſtrong loams and loamy clays, which do not lie wet in winter; for no land of whatever quality is ſuitable to wheat, that is much ſubject to wet in winter.

It was formerly the general practice to fallow the land intended for wheat, and likewiſe to give it a dreſſing of dung; for wheat requires good nouriſhment, and remains longer upon the ground than other crops of corn. In the modern huſbandry, wheat ſometimes ſucceed a fallow; and ſometimes it is ſown after clover and other crops.

About Michaelmas is the uſual time to ſow wheat, and in general it is moſt adviſeable to ſow it rather before than after that time.

There are ſeveral varieties of wheat, the red, white and yellow lammas, and the white and grey cone, or bearded wheat, and ſome others. The red lammas is moſt generally eſteemed and cultivated, and the cones produce the largeſt crops.

Many farmers prefer the burnbaked wheat for ſeed, becauſe it is commonly of a good bright colour, free from the ſeeds of weeds, ſmall even grain, and leſs liable to produce a ſmutty crop, than the wheat that is larger grained and plump. Several ſteeps have been recommended for ſeed wheat, to render it more prolific, and produce a larger crop, and the inventors of thoſe ſteeps direct that ſuch ſeed ſhould be ſown very thin upon the ground. The ſteeped corn has ſometimes produced good crops from a ſmall quantity of ſeed; but from many trials, it has been found, that the ſeed unſteeped, and equally thin ſown, produced as large crops as the ſeed ſteeped; the advantages conſiſted wholly in the thin ſowing, and the ſteeps pretended to multiply corn, are now neglected;

experience having proved that the farmer's dependance for a crop, ſhould be upon good ſound ſeed, good land and proper culture.

There is another preparation of wheat for ſeed, intended to prevent the crop being ſmutty. A diſtemper in wheat to which it is frequently liable, and is a great damage to it. Some have attributed the ſmuttineſs in wheat to wet ſeaſons; others to much dung, or particular ſorts of dung; and ſome have thought it proceeded from ſmall inſects; but from the moſt curious enquiry it is found, that neither of theſe is the true cauſe of this diſtemper, but that it ariſes from ſome other cauſe not hitherto diſcovered.

Some gentlemen in France have made many curious experiments upon ſmutty wheat; and they diſtinguiſh two diſtempers in wheat, that have a near reſemblance to it, to one they give the name of *carbon* or burnt ear; and call the other *ſmut*. The firſt is very common in France, and is by much the moſt injurious to their wheat crops. It is a contagious diſtemper, infecting the ſound wheat that it touches; the infected grains are full of a black, ſtinking duſt or powder; and this ſeems to be the diſtemper known by the name of ſmut in England. The grain of the other diſtemper, which they call the ſmut, is likewiſe full of black, ſtinking powder, incloſed in a ſkin or bag, ſo thin, that it commonly burſts, and the black powder is blown away by the wind, or beat off by the rain, before the wheat is carried to the ſtack or barn; this they call the ſmut: But it is the firſt diſtemper that is called here by that name; for it is common in England to find many of the ſmutty bags among the wheat, after it has been threſhed. This is the worſt ſort of this diſtemper, and the powder in the infected grain does certainly communicate the diſtemper to all the ſound wheat to which it adheres, which has been proved by many experiments.

The flour of ſmutty wheat is diſcoloured by that diſtemper, and the bread made of it has an ill taſte: So that ſome years the ſmut is of bad conſequence, when much of the wheat is infected by it; for it is not equally ſo every ſeaſon. Froſt is ſuppoſed to check the diſtemper, by killing the infected plants, that are weaker than the reſt.

The black ſmutty duſt adheres cloſely to all the grains of wheat that it touches, but does not penetrate the ſound grain, till it is put into the ground; ſome time after which the ſound grain is infected; and in March or April, if the ſheath that covers the ear is carefully opened, the young ears are ſeen to be infected, (and the embryo turned black) when no longer than the ſixth part of an inch; for this diſtemper infects firſt the organs of fructification, deſtroys the flour of the grain, and turns it into a black ſtinking duſt.

A grain of wheat forms in the earth a fibrous root, whence proceeds ſeveral ears; of theſe frequently but one, two, or three are ſmutty, and ſeldom all of them; ſometimes the grains in the ſame ear are ſmutty on one ſide of it, and ſound on the other: At other times, ſome grains are ſmutty, and the grains adjoining to them are ſound; and theſe ſound grains being picked out from the reſt and ſown, have produced ſound untainted wheat. The cauſe of theſe various appearances are as yet unknown.

But it has been found by many experiments, that the black, ſmutty duſt which ſticks to the ſound grain, is only ſuperficial, and does not infect the grain till it is ſown; and that if ſound wheat is ſown in a drill, and ſome of the ſmutty duſt is ſprinkled upon it, and covered with mould, the crop produced will be ſmutty.—Alſo, that if the ſmutty duſt that ſticks to ſound grain, is by any means waſhed off, or cleared away from it, ſuch ſound grain will produce a crop of ſound wheat free from ſmut: It is therefore certain, that the ſmutty duſt upon the ſeed is the cauſe of ſmutty crops in general; though there may be other cauſes for the origin of this diſtemper.

Steeps made with nitre, ſalts of ſeveral kinds, and lime, are found good to prevent this diſtemper; the method of brining and liming the ſeed is generally practiſed in England; ſome only ſprinkle the ſeed with brine and dry it with lime; but a much ſafer way is to put ſome of the ſeed wheat into a baſket, and plunge it into the brine and lime mixed, while the liquor is as hot as the hand will bear; ſtir the wheat very briſkly, with a ſtick or ſmall ſhovel, continually ſkimming off the light corn, till no more of it riſes to the top; and having drained the liquor from the wheat, ſpread it on the floor till dry. The wheat thus prepared, being ſometimes ſtirred and turned will take no damage, though not ſown for ſeveral weeks.

One principal intention of this preparation of ſeed wheat, is to clear it of the infectious duſt, as well as to deſtroy its infectious quality. It has indeed been proved, that waſhing the ſeed in ſeveral changes of fair water, ſtirring it forcibly, and carefully ſkimming off the light corn that ſwims at the top, will prevent the crop being ſmutty; yet as this requires to be done very carefully, and the brine being heavier than fair water will more readily bring the light faulty corn up to the top, it ſeems moſt adviſeable to uſe the brine, compounded as above of common ſalt and lime.

It is a general rule to ſow all ſeeds dry, and when the land is dry, but in ſowing wheat the practice is quite the reverſe; and it is the common cuſtom to ſow wheat when the land is wet, or very moiſt. The original of this cuſtom is from ſteeping ſeed wheat to prevent ſmuttineſs. But this being frequently done to exceſs, and continuing it in the ſteep a whole day, ſometimes longer, the wheat imbibes ſo much of the ſteep, that it ſwells, and being ſown in this condition, it ſoon begins to ſprout in the moiſt earth; but if dry weather enſues after the ſeed is ſown, the vegetation is checked, and much of it is damaged or killed.

For this reaſon, it would be more for the farmer's intereſt to ſow his ſeed wheat dry, and in dry earth, and then the vegetation would go on in a gradual regular manner, without any check or injury to the ſeed. And this the farmer may do ſafely, and without danger of a ſmutty crop, if he will be careful to get a good change of ſeed, clean, and free from ſmut; for ſuch ſeed will produce a crop of ſound wheat, without ſteeping it, as has been found by experience; whereof, if it was neceſſary, ſeveral inſtances might be here mentioned. But as it is now certainly known, that the ſmutty powder is the cauſe of ſmutty crops, clean ſeed that has none of that infectious powder upon it, renders ſteeping it unneceſſary, and alſo unneceſſary to ſteep any ſeed longer, than till that duſt or powder is waſhed off; which as it may be ſpeedily done, the ſeed will not ſwell nor ſprout; and, after the moiſture is dried off, may be ſown in dry land, and without waiting for rain, which will be much to the farmer's advantage.

The quantity of ſeed was formerly between three and four buſhels upon an acre, now not ſo much by near a buſhel; and for tolerable good land that is clean, two buſhel of ſeed are ſufficient for an acre. It is uſual with farmers to ſow more ſeed upon poor than upon rich land, and ſome writers have condemned and even ridiculed that practice; but wheat is a branching plant, and branches more upon rich than poor land, which is one reaſon for ſowing moſt ſeed upon poor land; and another is, more ſeed dies or fails upon poor land, and particularly of ſteeped ſeed, which thoſe writers do not ſeem to have well conſidered. I have made the experiment upon very poor land, and have been obliged to repeat ſowing it two or three times, when dry weather ſucceeded, and the ſeed brined and limed; the ſeed did not grow the firſt and ſecond ſowing, but became mouldy, and died for want of rain.

Early ſowing, as before obſerved, is the beſt huſbandry. In ſome of the light lands in Hampſhire, and other places, they ſow wheat in Auguſt, ſowing and reaping at the ſame time; and in the neighbouring counties, Wiltſhire and Berkſhire, wheat is ſown after turneps, ſo late as the end February, and ſometimes in the beginning of March, but in general, about the middle of September is a good time to ſow wheat; eſpecially if old ſeed is uſed, and not ſteeped; for that is longer in coming up than wheat ſeed of the ſame year.

Many farmers are afraid to ſow ſo early; becauſe, if it grows rank, or what is called winter proud, it is liable to be killed by froſt; but the danger of this is not great, if the land is dry and healthy; and if the blade ſhould hap- to be killed, the roots are not hurt by froſt in ſuch land, but will again produce vigorous plants, as has been obſerved in ſevere winters; for few plants are more hardy than wheat, with reſpect to cold, if the ſoil is dry.

In order to lay the weat dry in winter, the land ſhould be water-furrowed immediately after the ſeed is ſown; draw the furrows firſt with a plough, and clean out and deepen them afterwards with ſpades, eſpecially the large or main furrows or drains into which the ſmaller ones are to diſcharge the water; they ſhould be made as deep or deeper than the ſtaple of the land; and the whole done with great care, being a very neceſſary operation, particularly in ſtrong land.

Land is uſually dunged for wheat, though fallowed, but this an unneceſſary expence, and ſhould be omitted, provided the land has been well fallowed, as above deſcribed: for wheat is only a ſmall graſſy plant for near half a year after it is ſown, and cannot then exhauſt the land much, eſpecially if not too thick ſown, and no weeds. And ſhould the wheat appear weak in the ſpring, a good top-dreſſing with ſoot, coal aſhes, pigeon dung, or other light manure, ſown upon it by hand in February, will recover it to a flouriſhing ſtate.

Some experience is neceſſary to know the proper time to reap wheat; if cut too green it will be thin bodied, and hard to threſh out clean; and if too ripe, it becomes rough, produces much bran, and the flour has a brown colour. In general, it ſhould when reaped be filled with flour, the ſtraw yellow, but the knots of the ſtraw greeniſh; when cut it ſhould be bound up in very ſmall ſheaves; and now the farmer will find the advantage of his land being clean from weeds, his crop will be ſoon fit to carry home, and no neceſſity to delay it, till the weeds are withered and dry, by which delay the wheat is ſubject to much damage from wet, and other accidents.

The common huſbandry is to ſow wheat broad caſt, and very good crops are obtained in that way; but good crops may be got alſo, and even better than the broad caſt, and at a leſs expence, by drilling the ſeed. This may be done in equi-diſtant rows, a foot aſunder, and the ſpaces hand-hoed; or which is ſtill better, to drill the ſeed in double rows a foot diſtant, leaveing a ſpace of two feet broad between the double rows: but as this way of drilling may be difficult to a beginner, let him drill the whole in ſingle, equally diſtant rows, at two feet aſunder. In the the firſt way of twelve inch rows, half the ſeed is ſaved, for one buſhel to an acre is the proper quantity to be drilled. When the ſingle rows are two feet diſtant, ſome what leſs than one buſhel to an acre is ſufficient: becauſe a ſmall plough may be uſed between the two feet rows, which going deeper than hand-hoes, the wheat will be more vigorous, will produce more ſtalks, and fuller ears. This is alſo conſiderably cheaper than hand-hoeing.

The firſt hoeing ſhould be given in autumn, or begining of winter, when the wheat has three or four blades, by turning a furrow from the row of wheat into the interval, and another from the adjoining row; theſe two furrows, meeting in the middle in every alternate interval, will form a ſmall ridge there. The plough ſhould be brought very near to the row, or within about two or three inches of it; and though by hoeing ſo near the wheat, the plough will cut away ſome of the ſmall ſide roots, that will be no injury to the wheat, but a great advantage to it, by cauſing the roots to multiply; as the farmer will ſoon perceive, by his wheat becoming more vigorous, and of a deeper green colour, and the ſmall furrows made near the wheat will be a means of keeping it dry in the winter. If any clods ſhould fall upon the young wheat, they ſhould be immediately taken off, by a woman or boy following the plough.

If the land lies flat, and ſubject to be wet in winter, ſo that the ſmall furrows made by the plough are not large enough to carry off the water, it will be neceſſary to cut drains, at prober diſtances, length-ways, between the rows of wheat; for making croſs drains here would obſtruct the hoe plough.

Early in the ſpring, when the earth is dry, run the plough along in the furrows made in autumn, making them deeper, and as near to the wheat as can be done, without tearing out the plants; and then harrow down the ridge in the middle, laying the mould flat. The other intervals or ſpaces, that were not hoed in autumn, are now to be done; the hoe plough to be brought near the rows, and the earth thrown up in ſmall ridges in the middle as before. This will bury the weeds, that have grown up in theſe ſpaces in autumn, will looſen the earth next the rows of wheat on that ſide, and encourage the roots to ſpread and extend there.

By hoeing thus alternately and every time near the wheat, throughout the ſeaſon, every month, or as often as the growth of weeds, or ſtaleneſs of the ground makes it neceſſary, the land will be made very clean, kept in fine tilth, and an abundant crop may be expected. Nor is the tillage expenſive; for only half the land is tilled at each hoeing, one horſe is commonly enough to draw the plough, and no driver is neceſſary. Earth up the wheat at laſt, while it ſtands fair, to keep it upright.

Some farmers will probably be doubtful of obtaining good crops by this method; prefer twelve inch rows, and hand hoeing: to theſe it may be ſufficient to recommend a trial of both, upon ſmall quantities of land: the expence of ſuch trials is trifling, and the benefit ariſing from them may be of great importance.

Wheat that is reaped, carried and ſet up dry, will keep well in ſtacks for ſeveral years, will come out of a good colour, and handle well; yet there are ſeveral inconveniences in this way of preſerving it: The ſtraw that is long kept will be worth little; and the corn is liable to damage from rain, if not thatched very well, and frequently examined and repaired: and the damage done to the corn thus kept any conſiderable time, by vermin, mice in particular, is very great, and not eaſily prevented by any contrivance in making the ſtack, as it is not uncommon for for them to get into the ſheaves, while in the field, and are carried from thence into the ſtacks, where they multiply, and to a ſurpriſing degree deſtroy the corn, and cut the ſtraw. Thoſe farmers who can afford to keep ſome of their wheat for a market, which it is the intereſt of the community, and of the poor in particular, that they ſhould do, may preſerve it ſafe from vermin, and other accidents, in ſmall granaries, made of two inch oak plank, making the oak joints ſo cloſe that neither mice, weevils, nor any other vermin can enter. Wheat that is perfectly dry, when put into ſuch granaries, will keep ſweet a conſiderable time, without any trouble: but it is uſual to ventilate wheat preſerved in theſe granaries, by blowing air through the wheat in very dry weather, through holes made at bottom and top, covered by fine wire lattices, to prevent any vermin getting in there.

A Wincheſter buſhel contains 2150.42 cubic inches; and therefore a granary, that is a 120 inches ſquare, and 120 deep within, (or a cube of ten feet) will contain full 800 buſhels, or 100 quarters of wheat. One advantage of preſerving wheat in this manner, beſides the ſafety of it from damage, is, that the farmer will have the immediate uſe of the ſtraw, which is of conſiderable value for ſale, for his cattle or for thatch; which by the way we may obſerve, ſhould not be threſhed when intended for that uſe, which bruiſes and breaks the ſtraw; and as it contains ſome corn and weeds in it, the rain ſoaks into the ſtraw, and the corn and ſeeds of the weeds growing through, it is rotten in a ſhort time, and ſeldom makes a good, dry covering.

The beſt way of preparing the ſtraw for thatch, is not to threſh it, but make it up in handfuls, to cut off all the ears, and lay the thatch neatly on, as they do in Somertſhire near Bath; where their buildings, thatched with whole, unbruiſed ſtraw, have a neat appearance; and ſuch thatching is light, dry, and laſting.

CHAP. III.

OF RYE.

OF moſt ſorts of corn there are many ſpecies and varieties, but of rye only two, the winter and ſpring rye; and theſe are ſo much alike, that they are by ſome ſuppoſed to be but one ſpecies.

The winter rye is ſown ſometimes in Auguſt, but uſually in September or October; for feeding cattle, and particularly ewes and lambs in the ſpring: Or, if it has then a promiſing appearance, is ſuffered to ſtand for a crop. When it is fed down in ſpring, the land is immediately ploughed, and fallowed till July; then manured, and cropped with turneps. March or April is the time to ſow ſpring rye for a crop; which in favourable circumſtances is more plentiful than of wheat, and the ſtraw is better for thatch.

Any ordinary land that is dry, will, with proper tillage, produce good crops of rye; light ſtoney, gravelly, ſandy, chalky land; but if very poor, manure is neceſſary to obtain good crops. It ſhould be ſown dry, about three buſhels of ſeed to an acre.

It was formerly the cuſtom to ſow meſlin or wheat and rye together, and is ſometimes done ſtill in the North of England; but this is ſurely a very improper mixture, for they require very different kinds of ſoil, and ripen at very different ſeaſons; rye being one of the earlieſt ripe, and wheat one of the lateſt.

Bread made of rye is to ſome perſons diſagreeable, and to others is ſaid to be very pernicious, cauſing incurable diſtempers; and being in other reſpects much inferior to wheat, it is now very little cultivated in England for bread corn, except in ſome northern counties.

CHAP. IV.

OF BARLEY.

OF this grain there are ſeveral different ſpecies. The two rowed barley is the moſt commonly propagated for the London market, and the malt made of it moſt eſteemed. The long eared, and the ſprat, or battle door barley, are likewiſe good ſorts, but not generally ſown; and the winter barley, called alſo ſquare barley, bere and big, has four rows of grain; it is a hardy kind, is ſown in autumn, ripens early in the ſeaſon, and produces a greater crop than the two rowed. But being not ſo well eſteemed for malting for the London market, is ſown chiefly in the North of England, in Scotland, and Ireland. The land moſt ſuitable to barley is a light flexible loam; it will alſo thrive upon moſt ſorts of light land, well cultivated and manured, but not upon very ſtrong or clayey ſoils. The beſt time to ſow it is in March, or the beginning of April. Some farmers continue to ſow it till the firſt or ſecond week in May; but this is much too late: And if the ſeaſon for ſowing it cannot be had before that time, it will be the farmers intereſt to ſow buck wheat rather than barley.

Many farmers ſow barley too thick, four buſhels and ſometimes more upon an acre: But barley is a branching plant, and in good land, well prepared, about two buſhels to an acre is a more proper quantity.

It is the general practice to ſow broad clover ſeed with barley; not at the ſame time, becauſe, if a rainy or moiſt ſeaſon ſhould enſue, the clover will get too much a head, and by its luxuriancy damage the barley; but the clover ſeed ſhould be ſown ſeveral weeks after the barley, and when that is come up about three or four inches high. As it is uſual to roll barley, when grown up to that height, to break the clods and ſmooth the ſurface of the land for mowing the barley, then is the proper time to ſow the clover ſeed, which will be covered ſufficiently by the rolling. About ten pounds of clover ſeed to an acre, is the quantity commonly ſown; though leſs than half or about four pounds is ſufficient: Yet ſome modern authors direct twenty pounds to be ſown upon an acre; the conſequence of which muſt be, a vaſt number of poor, ſtinted, ſickly plants, that have neither room nor nouriſhment to arrive to near the perfection of thinner, vigorous, juicy plants. Only one weakly ſtalk riſes from one ſeed, of the thick ſown; but the thin ſown branches into three or four, to twelve or fourteen vigorous juicy ſtalks, by far more nouriſhing to cattle than the puny. ſapleſs plants of the thick ſown. The luxuriant clover among the barley ſtraw is a great improvement of the fodder for cattle.

The greateſt inconveniency of clover among barley, is in wet harveſts, when, if there is a long continuance of driving rain, the barley is much damaged to ſuch a degree ſometimes, that the crop is loſt, or little better than dung, after much expence and trouble beſtowed, in endeaing to ſave it; and then the young clover is alſo greatly injured, by the barley and clover lying too long upon it: This injury is ſome years ſo great, that to ſave the crop, and prevent the damage the young clover receives, by the barley lying long upon it, ſome adviſe the farmer to carry the crop into another field, to ſave it, in ſuch bad weather; but this would be very expenſive; and after all, the barley may begin to ſprout, and in that caſe will not be fit for malting. If ſo much fair weather can be had to dry the crop, it may be ricked, and given to cattle, the barley and clover together; which will be a rich heartening fodder for them, eſpecially if cut in a cutting box. It is, however, moſt adviſeable to guard againſt this misfortune, by ſowing the barley early, for then it will ripen early, and the owner will have the better chance of long days, and fair weather to ſave his crop.

It is uſual to let barley ſtand, till it is, what is called dead ripe, and the ears hang downwards; alſo to wait for ſome rain after it is mowed, in order to make the grain plump, and mellow it for malting. But very ripe barley is apt to ſhed, and much of it to be waſted; and waiting for a ſhower of rain is hazardous, and frequently endangers the crop: For theſe reaſons, it is ſafeſt for farmers to carry home their barley when in good order, and not wait for a change of weather, that may ruin his whole crop.

CHAP. V.

OF OATS.

THERE are ſeveral ſorts of oats. The black is a hardy ſort, and may be ſown early in February; the white near a month later. The naked oat is not cultivated near London; and the red chiefly in Cheſhire, and ſome of the neighbouring counties, where it is much eſteemed, though I think not ſuperior to the white ſorts; whereof the Poland and Scotch are good ſorts, but the former very apt to ſhed when near ripe. The Eſſex oat is one of the beſt of the white ſorts. Oats are ſtrong rooting plants, and will forage for ſubſiſtance, where barley would be ſtarved: for which reaſon they are generally ſown upon once ploughing; but if land is in good heart, and good tilth, they produce a larger crop than barley, and are more profitable in ſtrong land. They are frequently ſown in order to abate the too great rankneſs of land; and when ſown as thick as they often are, four buſhels of ſeed to an acre, they clean the land by overſhadowing and killing the weeds. They are reckoned great impoveriſhers of land; but this is chiefly owing to the inſufficient tillage given to the land ſown with them.

Oats are not proper to be ſown under furrow; becauſe in that way of ſowing, much of the ſeed will be laid too deep, and then they will not grow: they ſucceed well ſown in rows, and hoed, provided the ſeed lies only about two inches deep; but when clover is ſown with oats, they are not to be hoed, though they may in that caſe be drilled in equi-diſtant rows, a foot aſunder. Clover is ſown among barley, after the barley is up ſeveral inches above ground; otherwiſe the clover would out grow the barley, and damage the crop; but clover ſhould be ſown with oats immediately after the oats; or the oats (which grow higher and more vigorouſly than barley) will ſmother the clover. Barley may be drilled, but ſhould not be hoed, though no clover is ſown with it; for the hoeing will make the barley tiller or branch at every hoeing, and then the barley will be edge-growed, viz. it will ripen unequally; the ſtalks that riſe firſt will be firſt ripe, and the later ſtalks will then have ears but half ripe, or quite green; and barley that is unequally ripe is not fit for malting. The rows of drilled barley, with or without clover, may be from ſeven to twelve inches aſunder: when no clover is ſown, the rows, at 7 or 8 inches aſunder, is a proper diſtance; if wider, and no clover, the weeds will be encouraged to grow, and multiply more than in narrow rows.

The uſual quantity of ſeed ſown broadcaſt, is, of barley and oats, four buſhels per acre; which is double the proper quantity, if the land is in good order; and if drilled, about one buſhel per acre of oats or barley is ſufficient.

If the weather happens to be very dry in the ſpring, the land is then frequently ſo rough and cloddy that no ſpring corn can be ſown with any proſpect of ſucceſs; and if delayed till the clods are reduced by a viciſſitude of wet and dry weather, the proper ſeaſon for ſowing may be loſt. In this caſe, a heavy ſtone fluted roller is very ſerviceable to break the clods. But the moſt effectual inſtrument for reducing ſuch land (either in ſpring, or autumn) is the ſpiky roller; which being drawn over ſuch land, when it is very dry, twice in a place if neceſſary, will cruſh many of the clods; and the land being immediately ploughed, and rolled again, will be ſo compleatly reduced, that the barley or oats may be ſown directly with great ſucceſs, though the weather ſhould continue dry. The ſpiky roller is ſo uſeful an inſtrument for this, and ſeveral other purpoſes, that it would be very convenient for every farmer to have one of them, particularly for ſuch as occupy much ſtrong land.

Mr. Randall of York, the inventor of the ſpiky roller, deſcribes it of the following dimenſions: the roller to be of ſound oak, ſeven feet long, and eighteen inches diameter, bound at each end with ſtrong iron hoops; the ſurface of the roller is to be divided by ſtraight lines running length ways, as near can be four inches diſtant; and having prepared iron ſpikes, one inch thick at the biggeſt end, and from thence tapering to a point at the other end, and ſix inches long; the ſpikes are to be made hot, and entered into the roller half their length, or three inches, in the lines marked upon the ſurface of the roller, at four inches diſtance in the lines. The ſpikes being thus inſerted, a row into every ſecond line, the intermediate lines are to have ſpikes in like manner, inſerted into them at four inches diſtance. The ſpikes are to be placed in the quincunx order; thoſe in the laſt rows to be placed oppoſite to the middle of the ſpaces in the firſt rows: the ſpikes extending three inches above the ſurface of the roller, is found to be of a length ſufficient to break all the clods: and the blunt ends of the ſpikes being without ſide of the roller, it may be drawn upon any hard road with little damage to the road or the ſpikes. It is drawn upon the land to cruſh the clods, by three horſes abreaſt. A farmer who is furniſhed with a ſpiky roller, will be in no danger of loſing the proper ſeaſon of ſowing his land, by very dry weather.

It is neceſſary to be watchful of oats when near ripe, for if cut before they are ripe, they ſhrink much; and if full ripe, are apt to ſhed before they are cut; alſo in cutting them, whether mowed or reaped (as they ſometimes are) if a heavy crop. The waſte in cutting and turning the ſwarths, is ſometimes as much as the ſeed ſown; which is viſible, if the oat ſtubble is ploughed in with a light furrow, as ſoon as the crop is carried off, for then the ſhattered corn will come up as thick, as from ſeed in the ſpring.

Theſe ſelf ſown oats, if not diſturbed, will in mild winters grow up, and produce a crop of very fine oats, (ſuperior to thoſe raiſed from ſeed in the ſpring) which the farmers call a baſtard crop; and if it was not that oats are liable to be killed by froſt, in ſevere winters, it would be much the beſt way to ſow oats in autumn.

It is ſometimes difficult to chuſe the right ſeaſon of ſowing ſpring crops; one good indication of the proper ſeaſon, is by obſerving the proper time when the trees put forth their leaves: Gardeners, by taking notice of the time when the mulberry trees produce their leaves, can judge that the great froſts are then paſt; and farmers, by obſerving the ſame of ſome particular trees growing upon their land, will find them of uſe to direct them to the proper time of ſowing, indicated by nature.

CHAP. VI.

OF BEANS.

THE common horſe bean is a hardy plant, and thrives beſt in ſtrong, moiſt, clayey ſoils; the month of February is the prime ſeaſon to ſow them, and the beginning of that month the beſt time, if the land is then in order, and in good tilth to receive the ſeed. Three buſhels of ſeed is the uſual quantity to ſow broad caſt, and the produce about three quarters.

But the method of ſowing beans now in uſe in many places, is to plant beans by hand with a dibble, in rows about eighteen inches diſtant; and the beans five or ſix inches aſunder in the rows; ſome plant them at a greater diſtance in the rows, and two or three beans in every hole about three or four inches deep: and by this means, they may be hand hoed all round. But there is an objection to dibbling beans, or other ſeeds, or tranſplanting of any plants by dibbling, particularly in ſtrong land; for in thruſting down the dibble, the earth is ſo much compreſſed, all around the ſide of the hole, that in wet weather the hole ſtands filled with water; and in dry weather, the ſides of the hole become ſo hard, that the young tender fibres are confined, and cannot ſpread, to collect nouriſhment for the plants. This ill effect of dibbling ſeeds or plants, is found from experience, and comparative trials; and the progreſs of plants ſet in looſe mellow ſoil, beyond thoſe that are dibbled, is very remarkable.

A better way therefore, is, to open ſmall parallel drills or furrows in the land, with a ſmall plough, and round pointed ſhare; to ſow the beans into theſe furrows by hand, and cover them with harrows. This way is more expedious than dibbling, and cheaper

But another method, and by much the beſt of cultivating beans, is to drill the ſeed upon five feet ridges, two rows a foot diſtant, upon the middle of each ridge; the intervals, or four feet ſpaces between the double rows, to be horſe hoed with a ſwing plough; and the narrow partitions between the double rows to be hand hoed. As ſoon as the beans are advanced to about three or four inches high, plough away the earth from about both ſides of the rows, which being turned into the intervals, will form a ſmall ridge there; the plough ſhould go within two or three inches of the rows of beans. In about three or four weeks after this firſt horſe hoeing, plough the ridges of earth in the intervals, back to the rows of beans; and thus continue to plough the earth reſpectively, from and to the beans, ſo long as there is room for the plough to work; and plough deep. Theſe deep hoe ploughings, will effectually deſtroy all the weeds that come up in the intervals. The weeds between the narrow rows are to be cut down by the hand hoe; and the large ones, if any in the rows, are to be pulled up by hand: and if theſe hoeing and hand weedings are performed carefully, the land will be made very clean; be brought into fine tilth; and produce a better crop than is commonly obtained with leſs manure. And another great advantage of this method is, that wheat may immediately ſucceed the beans: drilling the ſeed wheat in rows two feet diſtant, and cultivating it, by hoeing with a ſmall plough, as directed in the chapter on wheat.

As ſtrong land is the moſt ſuitable to both wheat and beans; alternate crops of theſe is the moſt profitable huſbandry; and no other change of crops is neceſſary for ſuch land; eſpecially as both may be made hoeing crops, with very little manure, which may be ſaved for other purpoſes.

Beans are late ripe; but if bound up in very ſmall ſheaves, and ſet up in ſhocks, they may remain in the field with little danger from the weather; and when dry, carry them home, and put them in the barn; but if not ſo throughly dry as to be ſafely houſed, put them up in ſtacks; where if they take a good ſweat, they will be fit to be threſhed, and given to horſes immediately, with as much ſafety as old beans, and be eaſier for the horſes to grind them.

The ſort of beans called large ticks, or negro beans (becauſe frequently exported to the Weſt Indies, for the uſe of the negroes) are a large ſort, very proper for horſe hoeing, and by that culture produce greater crops than the common horſe bean; they are cultivated in the ſame manner as the common horſe beans, only allowing them a little more room in the rows.

If it happens to be a late ſeaſon, and the beans are long in drying, the ſowing of the wheat ſhould not be delayed; but let the beans be ſet up, in a corner of the field, upon the tops of ſome of the ridges, or in ſome adjoining ground, to dry, that the ſowing of the wheat may be finiſhed in good time.

From the time of harveſting the wheat, about the beginning of Auguſt, to the ſeaſon of planting of beans, the beginning of February, is between five and ſix months; if the land lies at reſt all this time, it will gain little in fertility, and repeatedly tilling it during that time, will be expenſive, and no crop received to anſwer that expence: but the induſtrous farmer ſhould not ſuffer his land to remain ſo long in a manner idle and unprofitable to him; it ſhould be always employed, and under ſome valuable crop. The opinion of the old farmers, that land wants reſt, is now found to be an error: the preparation of land, by the neceſſary tillage and manure, for a change of crops, will keep it always in heart; and the hoed crops in particular, at the ſame time they are drawing nouriſhment from the land, are enriching it from the atmoſphere by repeated hoeings.

To apply this in the preſent caſe: as ſoon as the wheat crop is carried off, give the land a dreſſing with ſome ſuitable manure, and plough it; then plant it with coleſeed plants, raiſed on a ſeed bed; the beginning of July; theſe may be planted in ſingle rows on three feet ridges, or in double rows on five feet ridges: the rows a foot aſunder, and about a foot diſtant in the rows. Theſe being hoe ploughed in the manner before deſcribed, will continue growing till the ſeaſon of planting beans, and are very good and agreeable food for black cattle and ſheep. Green ſavoys, borecole, and others, will do the ſame; and thus the farmer may eaſily obtain three crops in two years; much more profitable than the common huſbandry.

CHAP. VII.

OF PEASE.

OF peaſe there are many ſorts or varieties, known by different names in different counties: It may be ſufficient here to diſtinguiſh them by three names, the large grey, the blue, and the white. The firſt requires the ſame kind of ſoil as beans, and to be ſown at the ſame ſeaſon, viz. in February, and early in that month as the land can be got in good tilth for them. The blue is ſown in various ſoils, and the white in rich, ſandy loams.

Peaſe by their thick cover deſtroy weeds, and mellow the ſoil, and therefore are generally eſteemed to be meliorating crops; and like other ſucculent plants, the greater crops the more they improve the land. They are all weak, trailing plants, unable to ſupport themſelves, and when ſown alone broad caſt, lye upon the ground: In that ſituation, the weeds grow through them, and they are ſo entangled and matted, that they produce no kids, except near their tops, and where they have air. For this reaſon, the farmers have ſown ſeveral ſtronger and upright growing plants among peaſe to ſupport them; ſometimes oats, but moſt commonly beans; and where the ſoil and ſeaſon is ſuitable to both, as beans among grey peaſe, they produce good mixed crops; but otherwiſe are not to be depended upon.

Moſt farmers eſteem peaſe to be an uncertain crop; but this opinion ariſes chiefly from an improper culture of them; ſowing them upon unſuitable land, and eſpecially not beſtowing upon them ſufficient culture: It being not uncommon to ſow peaſe upon once ploughing, which ſhould never be done; nor upon any land, till it is brought into fine tilth.

The moſt perfect culture of peaſe is to ſow them in rows, to ſet ſticks to the rows, for the peaſe to run upon, and to hoe between the rows. By this culture gardeners find, that peaſe will produce above double the quantity that they do when not ſupported; but this method being too troubleſome and expenſive to be practiſed in the fields, farmers muſt be contented to cultivate peaſe in ſuch manner as comes neareſt to the garden culture, and is practicable in large concerns. And this is found to be by drilling the ſeed, and hoeing the plants in ſuch a way, that the rows may join and ſupport each other. This is done by drilling the peaſe in even rows a foot diſtant; drill about two buſhels of large peaſe upon an acre; and when the peaſe are about ſix or eight inches high, and ſtand upright, they are to be hand hoed, earthing the peaſe up on both ſides; which will ſupport them till the rows join, and mutually ſupport each other by their claſpers. Or, which is a better method, drill a double row a foot diſtant; and then another double row, at twenty inches or two feet diſtance from the firſt, and thus throughout the field; a ſmall plough drawn by one horſe may then be introduced to hoe the wide ſpaces, and the narrow ſpaces hand hoed, gently earthing up the plants, as to make them lean towards each other, over the twelve inch ſpaces, where they will unite by their claſpers. In this method the horſe hoeings ſhould be repeated, ſo long as there is room for the horſe and plough. They will thus have more air and ſun, and being alſo hoed deeper by the plough, than they can by the hand hoe, in the twelve inch ſpaces, will produce a better crop. They are to be cut with a hook, laid in ſmall heaps, and often gently turned till dry, and fit to carry home.

CHAP. VIII.

OF VETCHES.

OF vetches (called alſo tares, thetches, &c.) two ſorts are commonly ſown, the winter vetch, ſown in September or October, and the ſummer vetch, ſown in the ſpring. They are very good ſoiling for horſes, cut and given to them green; if to be uſed in that manner, or for cleaning and mellowing the land, ſow them broad caſt, three buſhels to the acre: If intended to ſtand for ſeed, drill and hoe them as peaſe, with two buſhels of ſeed to an acre. There are two ſorts of theſe, the ſeed of the one black, and of the other white: The crops of both are nearly equal, but if the white ſort are ſown broad caſt, and harrowed in, the firſt rains will waſh off the mould, and expoſe much of the ſeed to the view of pigeons, and other birds, and will be by them devoured: For this reaſon, the white ſort is rarely ſown by farmers.

A good healthy loam, in fine tilth, is the moſt proper for this crop; and when they ſucceed, produce a great crop; but if much hurt by the ſeverity of the winter, the land may be ploughed, brought into fine tilth, and ſown or drilled early in the ſpring, with ſummer vetches; which will yield a good crop, though not commonly ſo large as the winter vetch: Both ſorts are very good given to cattle green. In Dorſetſhire, the farmers give them to their ewes green the beginning of May, which cauſe the ewes very ſoon to take ram; and many of theſe are brought to Way-hill fair, the beginning of October, ſome with lambs by their ſide, and ſold to the farmers of ſeveral neighbouring counties, to be fed upon turneps.

If the vetches are not cut green, nor intended for ſeed, many farmers allow them to ſtand till they kid, and the kids begin to fill; they then cut them in fair weather, ſave and ſtack them as hay. They make a hearty fodder for cattle, particularly for horſes; the ſeed is particularly agreeable to pigeons.

C H A P. IX.

OF BUCK OR FRENCH WHEAT.

THIS is a very ſucculent plant, bears a three cornered ſeed, reſembling beech maſt, black on the outſide, but within full of white flour. It is a very nouriſhing food for cattle and pigeons; and when ground, very proper to fatten hogs and poultry. The beſt time to ſow it is in May; it grows up quick, but not high, and ripens in Auguſt or September, and ſeldom fails. It produces a large crop upon poor, light land, about ſix quarters per acre; but conſiderably more upon a good dry loam, eſpecially in wet ſummers. It is in no danger from the weather after it is cut, which is a great recommendation of it; and in that, and other reſpects, merits the farmers attention. When the ſeaſon happens to be late for barley, buck wheat may be ſown to good advantage, and will then be more profitable than barley late ſown. It ſo completely covers the ground that the weeds are effectually kept under by it; and ploughed into the ground as a dreſſing, is an excellent preparation for wheat, upon good barley land.

CHAP. X.

OF CLOVER.

IT is a matter of great importance to every farmer to have plenty of food for his cattle, that they may be properly fed; and to obtain plenty of manure for his land. He ought to be furniſhed with a ſufficient proportion of meadow and paſture ground for them; and likewiſe of thoſe improperly called artificial graſſes. Of theſe, the broad or red clover was firſt introduced in England from Flanders, upon the recommendation of Sir Richard Weſton, about 130 years ago, but not generally cultivated in England more than about half that time. It is now moſt commonly ſown with barley and oats in the ſpring. And though ſome writers have adviſed to ſow it in autumn, I have found from experience, as have alſo ſeveral other perſons, that ſowing it then is too hazardous, being ſubject to be deſtroyed by froſt the enſuing winter, unleſs the weather is then uncommonly mild; but if ſown in the ſpring, it will be ſo well eſtabliſhed, that no common froſts will hurt it afterwards.

Cattle are apt to eat clover greedily at firſt; and if great care is not taken, it will hove or ſwell them, ſo as to endanger their lives, if not immediately relieved by ſtabbing them with a ſmall knife near the hip bone, where the ſwelling riſes higheſt: this lets out the pent-up air, and gives them eaſe. They ſhould be fed upon clover ſparingly at firſt, only an hour or two at a time; and when the clover has no wet nor dew upon it, till they are accuſtomed to it, after which there is not much danger.

Having already treated of the uſual method of cultivating it the firſt ſummer, it may be ſufficient to take notice here, that it produces one large crop of hay the ſecond ſummer, and a plentiful feeding for cattle afterwards; and then the land is ploughed once and ſown with wheat. As it is a luxuriant and ſucculent plant, it covers and ſhades the land, deſtroys weeds, and is a very good preparation for wheat; whereof good and clean crops ſucceed the clover, if that has been a full crop. Farmers have generally ſuppoſed, that feeding the ſecond crop of clover, was more advantageous than mowing it; and that the dung and urine of the cattle fed upon it, would more enrich the land, and better prepare it for the wheat, than letting the clover ſtand for a ſecond mowing crop; but this has lately been diſcovered by experiment to be wrong; and that taking two mowing crops is the beſt huſbandry, making the land cleaner, and improving it more. This ariſes from the ſame principle, as its improving the land by the firſt mowing crop, which kills many of the weeds by its ſhade and cover; and from the ſame cauſe, a ſecond crop compleats the deſtruction of the weeds, and continues to improve the land ſtill more than one crop, which has been proved by trials of both methods.

Hogs may be kept upon clover great part of the ſummer, and is reckoned a profitable application of it, but will not ſo effectually clean the land as the mowing crops.

In making clover hay, it ſhould not be ſhaken, ſpread out, and cocked, as common meadow hay, but ſhould remain in ſwarth, as it falls from the ſcythe, till it is dry on the upper ſide; the ſwarths ſhould then be turned in fine dry weather, and when dry on the upper ſide, laid in wind rows; and afterwards managed as oats that are mowed. It may be carried and ſtacked while the ſap is yet in it, and will take no damage, provided it is perfectly dry when ſtacked; and that funnels are made in the ſtacks, and they are immediately well thatched to keep out rain; for clover having large ſtalks, lies hollow, and is quickly penetrated by rain, whether in cocks, or in ſtacks; the wet will quickly make it mouldy, and ſpoil the colour of it, which frequently turning it will prevent in the field; and in the ſtack, if ſet up dry, and thatched immediately. When thus managed, ſetting it up while juicy is a great advantage to the hay, cauſing it to take a good heat, to be cloſe in the ſtack, and come out of a fine colour.

Some farmers let their clover ſtand another year, and ſometimes obtain good crops the ſecond ſummer, and for this purpoſe they dreſs the land with dung; but it is better to ſow the wheat upon the firſt year's lay. The land becomes ſtale by leaving it under clover a ſecond year, which is not only an uncertain crop, and in that caſe not ſo proper to be ſucceeded by wheat, and likewiſe the land becomes foul, and the dung encourages the worms and inſects to multiply ſo much, that the wheat is ſometimes almoſt deſtroyed by them while in the blade.

It is common with farmers to mow their firſt crop of clover, and let the ſecond ſtand for ſeed; but this is very hazardous: for although they may in this manner obtain a good crop of ſeed, in favourable ſeaſons, it is frequently otherwiſe. The rainy or miſty weather, that moſt commonly happens late in the ſeaſon, prolongs the time of the ſeed ripening; and ſometimes both ſeed and hay are loſt, and often damaged; the ſeed of the ſecond crop is hard to get out, and is for the moſt part much inferior in quality to that from the firſt crop, called maiden ſeed; which is a material conſideration. The farmer who would be ſure of good ſeed for his own uſe, ſhould allot a field of clover for that uſe, and ſave his ſeed from the firſt crop; for then the weather being generally ſettled fair, the ſeed will ripen well, and is eaſily ſaved.

From the circumſtances of clover agreeing well with moſt ſorts of land, and particularly with the beſt wheat land; that it produces large crops of hay, and good after feed; and that wheat ſucceeds well after it upon once ploughing; it is undoubtedly a very valuable graſs to farmers, and is become a very general improvement.

There are ſome other kinds of clover cultivated by farmers; whereof one of the moſt valuable is the white honey ſuckle graſs, or Dutch clover; ſo called, becauſe much of the ſeed was imported from Flanders before it was cultivated here by farmers; but it is a native of Britain, Ireland, and many other countries; and the ſeed of it may be eaſily ſaved here. It loves a moiſt ſoil, rather ſtrong than very light; is a low plant, but very ſpreading, ſo as to overcome all common weeds, except ſuch as are rank and large. It makes an extraordinary ſweet paſture, agreeable to all ſorts of cattle throughout the year. They are not indeed fond of its flower ſtems, but kept cloſe fed down, no paſture is more ſo; and though it is ſo ſweet that cattle bite it cloſe to the ground, it is not deſtroyed, but thickens ſurpriſingly, and never wears out by being fed.

The white clover, and likewiſe the ſmall red, (which is alſo a native of our iſland, and of many other countries) ſeem to be dormant in the earth for ages; for there are ſeveral late inſtances where both theſe kinds of clover, particularly the white, had never been obſerved, till the land was well dreſſed with coal aſhes, or ſuch warm manure, and have then come up thick, till the white had covered and taken full poſſeſſion of the ground. Sheep are particularly fond of the white clover; and it will maintain, ſummer and winter, more ſheep than five times the ſame extent of the beſt ſheep downs. In laying down land with white clover, the ſeed ſhould be ſown in March or April, about eight pounds to an acre.

The hop clover, and noneſuch, are ſmall plants, and of ſhort continuance. They are ſometimes ſown with ray graſs.

CHAP. XI.

OF RAY GRASS.

THE ray, rye, or rey graſs, is a ſort of darnel, and is liked by moſt ſorts of cattle. It will grow on moſt ſorts of land, but thrives beſt on the ſtrong and moiſt. The principal uſe of this graſs is in the ſpring, for it comes in early. It is a hard, wiery graſs, with few leaves, and an impoveriſher of land; but its coming in early reccommends it to the farmers, as it is ready for feeding by the middle of April. Some farmers lay down their land to paſture with this graſs and clover; but this is a very wrong practice, becauſe the broad clover particularly, commonly dies the third year, and then weeds ſpring up in its room; for which reaſon none of the graſſes are proper to be ſown for paſture, but thoſe that are perennial, or abiding; whereof the white or honey ſuckle graſs is one of the moſt proper. The ray graſs is ſown with clover, as a corrective to the clover,

ver, and in ſome meaſure to prevent cattle being hoved or ſwelled by it; but the ray graſs is paſt its prime before the clover is ready, and cattle do not then reliſh the ray graſs; nor will they touch it in the field after the flower ſtems of it are ſhut up.

CHAP.

CHAP. XII.

OF SAINFOIN.

THIS plant, originally brought from France, has, next to clover, been the longeſt cultivated in England, as food for cattle, of any of the cultivated graſſes; and much deſerves the farmer's attention; but cannot be made an article of ſo general culture as clover, becauſe it will not ſucceed in cold, wet, and ſpringy land; but if ſown upon ſuch land, will ſoon decay and die. But upon dry ſoils, though very poor, is an extraordinary great improvement. Land of that quality, not worth more than two or three ſhillings an acre rent, having in many places been improved by it to twenty, and even to thirty ſhillings an acre. And if the land is of a pretty good quality, and it is manured ſometimes with peat or coal aſhes, it will laſt and flouriſh for fifteen, or twenty years, or upwards.

It has a very long tap root, which penetrates deep in the ground, on which account it is not hurt by hot or dry weather, but in ſuch ſeaſons generally produces the largeſt crops in dry deep ſoils; for the deep tap roots always find ſufficient moiſture below to keep it in a growing, healthy ſtate.

It is however moſt commonly ſown upon land that has a chalky or rocky bottom; and as it thrives well on ſuch land, moſt farmers have taken up an opinion, that the reaſon of its thriving upon ſuch land, is becauſe the chalk or rock ſtops the decent of its tap root, otherwiſe they imagine that ſainfoin has ſuch a propenſity to penetrate deep in the ground, that if not ſtopped, it would, they ſay, ſpend itſelf in root. The farmers are right that ſainfoin thrives well upon chalk, but are entirely miſtaken of the cauſe. Chalky land is dry, and never retains water though ever ſo deep; which is ſeen in Hampſhire, and other chalky countries, where they dig wells to the depth of ſome hundred feet, but find no water, till they come to clay, gravel, or ſome cloſe ſoil that ſtops the deſcent of the rain water; and upon theſe beds of cloſe earth water is found in plenty. The roots of the ſainfoin cannot reach ſo deep as theſe beds, and therefore is not injured by the water that lies upon them; nor do they find ſufficient moiſture in the chalk, and would therefore be ſoon killed by heat and drought: but the ſoil above the chalk being commonly of a loamy quality, retains moiſture ſufficient to nouriſh the ſainfoin in ſuch weather. But where there is not a proper depth of ſuch ſoil, ſainfoin is burnt up and deſtroyed, as has been obſerved where it grows upon a thin ſtaple, lying above a ſlaty quarry: and what proves this to a demonſtration is, that ſainfoin has been ſown by ſeveral perſons upon deep, ſandy loam, where there was no chalk, quarry, or other obſtruction, and where the tap roots have been found to deſcend thirteen or fourteen feet deep; and there the ſainfoin has flouriſhed remarkably, and produced greater crops than it was ever known to do upon chalk ſoils. It would indeed be an unaccountable circumſtance, if a plant did not thrive beſt where it was beſt furniſhed with roots; the contrary univerſal opinion of farmers being, in this caſe, repugnant to all ideas of vegetation; and I ſhould not have inſiſted upon this ſo much, but with a view to remove their erroneous opinion, in the culture of one of the moſt valuable plants hitherto introduced into the Britiſh huſbandry.

It is not however denied, that ſainfoin often thrives upon chalky or rocky ſoils, where its tap roots are ſtopped from penetrating deep; but in that caſe its roots ſpread near the ſurface, and the plants require more room to ſpread their roots, and collect nouriſhment. They may ſtand cloſer upon the ground if they have long roots, which find nouriſhment below the ſtaple; but if their roots are abridged in length, they muſt be allowed a greater diſtance, and more room to ſpread; otherwiſe the plants cannot produce ſo large crops. Another circumſtance ſhould alſo be conſidered, that the ſpreading roots near the ſurface of the ground is liable to be injured by drought, and the heat of the ſun; while the deep tap roots are entirely ſafe from theſe dangers. By obſerving this difference, the farmer may judge at what diſtance it is moſt proper his plants ſhould ſtand upon the ground.

Much of the ſainfoin ſeed, commonly ſold is bad, and will not grow; and the farmer ſhould carefully examine ſuch ſeed before he ſows it. The huſk of good ſeed is of a bright colour, and the kernel (which is the real ſeed) is plump and freſh; and which is a ſurer mark of good ſeed, if cut a croſs with a knife, it is full, and of a freſh green colour. But the moſt certain way of trying the goodneſs of the ſeed, is to ſow a certain number of the ſeeds; as ſuppoſe 100 in a drill, at a little diſtance apart, and ſift ſome fine dry mould upon them, covering them about half an inch deep; and when the plants come up, the proportion of good ſeed may be ſeen.

This ſeed is uſually ſown in the huſk, and then it is light; a buſhel of it weighing only about twenty-eight pounds: and the number of ſeeds in a pound I have found to be about 20,000, but good ſeed differs in ſize conſiderably. The quantity ſown broad caſt is from five to ſeven or eight buſhels per acre; and five buſhels is 2,800,000 ſeeds, or 64 ſeeds to each foot ſquare; which is above ten times the number of plants neceſſary or proper to grow upon that ſpace of ground. The reaſons that ſo great a quantity of ſeed is ſown are, that much of the ſeed commonly ſown is not good; that the ſeed being light, many ſeeds in harrowing riſe to the ſurface of the ground, and if they grow are malted; others are laid too deep, eſpecially if ſown under furrow, and are buried; and as in broad caſt the ſeeds are laid unequally, the plants in many places grow up in thick bunches, and ſtanding too thick, many of them are ſtinted or ſtarved for want of nouriſhment.

To avoid theſe inconveniences, the farmer who chooſes to ſow ſainfoin ſeed broad caſt, is adviſed to ſet out the plants with a hand-hoe, to the diſtance of about ſix inches every way, which is full near enough to yield large crops; for in common ſowing, ſainfoin riſes to the height of two feet; and if allowed room, grows three or four feet high. The beſt way is to drill the ſeed, and then the plants are eaſily ſet out to the proper diſtance; and if the drilled ſainfoin is in wide rows and horſe-hoed, the plants will grow large, and five feet high. The ſeed ſhould not be covered above half an inch deep; otherwiſe, being weak at firſt, the plants are not able to riſe above the ground, eſpecially if the ſoil is at all ſtrong.

The land ſhould be well prepared for ſainfoin, by deep ploughing, and making it very clean from weeds; which next to compleat fallowing is moſt effectually done by hoed crops; turneps particularly, drilled upon four feet ridges, well manured (not with dung) and horſe-hoed. And if the land is very foul, plant cabbages immediately after the turneps upon four feet ridges, and horſe-hoe them till July; and then another crop of horſe-hoed turneps will effectually deſtroy the weeds, and prepare the land for ſainfoin. Weeds are thus deſtroyed at a much cheaper rate than by often hand-hoeing the ſainfoin afterwards; for at any rate it ſhould be kept clean till the plants grow large and cover the ground the ſecond or third ſummer. The farmer ſhould not think much of this expence:

one acre of land, well prepared and cultivated, will be more profitable to him than two or three acres managed in a ſlovenly manner. Farmers beſtow ſeveral hoeings upon turneps, which continue but one ſeaſon; but ſanfoin well cultivated, will produce great crops for many years. The moſt perfect culture of it is by horſe-hoeing; but land kept in fine tilth is not fit to make hay upon: ſainfoin ſown broad caſt, commonly managed, as produces but one crop in the ſeaſon; but being ſet out as before mentioned, hoed and frequently dreſſed with aſhes, it will in good land yield two large crops every ſummer, to the amount of five or ſix tons of hay per acre; and be more profitable than the beſt corn land upon the farm.

Sainfoin ſhould not be fed by any cattle the firſt year, nor any year after the firſt later than October, otherwiſe they will do it irreparable damage; ſheep in particular, by biting off the leaf buds cloſe to the heads of the plants: For though a plant of ſainfoin, after the crown is cut off a handful below the ſurface of the ground, will recover, and ſhoot up again; yet if the buds are repeatedly nibbled off by ſheep it will die; eſpecially if the ſheep are ſuffered to feed upon it in the ſpring, which ſhould never be done, nor fed by ſheep or other cattle, but only between the laſt mowing, and the latter end of October.

Sainfoin is very agreeable to horſes and all ſorts of cattle, green or dry; and a dairy may be profitably kept upon poor land ſown with it. When mowed for hay, it ſhould be cut before it begins to bloſſom, and the hay made and ſet up, as above deſcribed for clover. By cutting it at this early time of its growth, it will ſhrink conſiderably in drying to hay, but ſuch hay is extraordinary rich and nouriſhing; horſes have been kept fat upon this hay throughout the year without corn, though worked hard all that time; and ſheep have been expeditiouſly fattened with it, to the value of four pounds per ton, for the hay.

If the ſeaſon happens to be rainy, that it would be too hazardous to mow the ſainfoin, before it begins to bloſſom; it may be cut when in bloſſom, and will then be ſuperior to any common hay; and if the rain continues till the bloſſoms are dropping off, it will ſtill make good hay, and more in quantity per acre, than if cut before, or in the time of bloſſoming: So that there are more chances of obtaining a good crop of this, than of common hay; and is made with much greater expedition, and at leſs expence, upon a dry and elevated ſituation, where ſainfoin is uſually ſown, than can be done upon low, flat meadows.

If ſainfoin is allowed to ſtand for ſeed, there is ſome nicety in cutting it at the proper time. It produces long ſpikes or ears, upon which the red bloſſoms, and afterwards the ſeeds, are produced. Theſe do not ripen all together; but thoſe at the bottom of the ear ripen firſt, and gradually upwards towards the top. In order therefore to ſave the greateſt quantity of good ſeed, the ſainfoin ſhould be cut when the lower ſeeds are ripe, and thoſe towards the top near full. Cut it in the dew of the morning or evening, to prevent the ripe ſeed ſhedding, which it is apt to do, if cut in hot, dry weather; the ſwarths for that reaſon ſhould be turned with great care, and the ſeed threſhed out in the field, or in the barn. The ſeed is ſo apt to ferment, and be ſpoiled, that it is neceſſary to lay it among clean ſtraw, in layers of ſtraw and ſeed alternately, which will keep the ſeed cool, of a good colour, and prevent its fermenting. A good crop will yield about 40 buſhels of ſeed upon an acre, which horſes will eat preferably to oats.

It is difficult to ſave much good ſeed for ſale, and the threſhed ſtraw is good for little. The farmer therefore will find it moſt for his intereſt to ſave ſeed only for his own uſe; to do which in the beſt manner, he ſhould drill the ſainfoin intended for ſeed, in rows about two feet and a half diſtant, hoe it with a ſmall plough, throwing the earth up to the plants at the laſt hoeing; when the ſeed is ripe, cut the heads off by hand with a hook, and afterwards mow the ſainfoin for hay, which will be better than the hay of threſhed ſainfoin, becauſe the threſhing beats off the leaves. The ſeed may be ſaved from damage or fermenting if mixed with layers of ſtraw, as above deſcribed; and laid in ſome place ſecure from rats, otherwiſe they will ſoon devour the ſeed. In this manner the farmer may ſave prime ſeed for his own uſe; which is a matter of conſequence, and ſhould be attended to, in order to obtain vigorous plants, and large crops.

Farmers are in general of opinion, that large growing ſainfoin, is coarſe and of inferior quality to the ſmall, leafy ſort: They ſuppoſe this likewiſe of other graſſes; ſo that they will be ready to condemn the advice here given, if allowing ſainfoin good room, that the plants may grow large; but let them who are of this opinion, make a fair trial of both, and then they will find, as others have done, that the large ſainfoin is the moſt nouriſhing to cattle, provided it is cut at the proper time, viz. before it bloſſoms. If ſainfoin ſtands too long uncut, much of the ſap evaporates, and then the fibres becoming hard and dry, the large ſtalks are pipey, and cattle do not reliſh them: But vigorous, quick growing plants, are always the moſt juicy and nouriſhing, if cut in time, and the hay much ſuperior: For making them into hay does not alter the quality of the plants.

CHAP. XIII.

OF LUCERNE.

THIS plant is ſaid to be a native of a warmer climate than Britian; but thrives well here, and in moſt countries, where well cultivated. It is a trefoil, the ſtalks, very upright, grows about three feet high, and very quick. It is much ſown in the South of France, broad caſt; where, in favourable ſeaſons, it is cut ſix or ſeven times in the ſummer, and ſometimes produces near ten tons of hay per acre. In England it produces four, five, and ſometimes ſix crops or cuttings in the ſeaſon, from April to September: for it advances in height about an inch a day, and is fit to cut once a month. It is a very ſucculent or juicy plant, and more nouriſhing to cattle than any of the cultivated graſſes.

Lucerne is a tap-rooted plant, and deſcends into the earth as deep, or deeper than ſainfoin; and with ſuch a force of vegetation, that it will, as I have ſeen it, penetrate into the hardeſt gravel, yet is not able to withſtand common weeds or graſs; which if ſuffered to grow among the lucerne, it will decline and ſoon die. This ſeems to be occaſioned from the weeds and graſs robbing the lucerne of its nouriſhment, near the ſurface of the ground; for lucerne has very few lateral or fibrous roots, and weeds and graſs are full of them; which drawing away the nouriſhment from the lucerne, near the ſurface of the ground, alſo weakens its tap roots, that they are not able to puſh deep in ſearch of food. But whatever is the cauſe, it is certain from all experience, that lucerne will not thrive long in any ſoil, where weeds or graſs are ſuffered to grow among it: and therefore it will be in vain for any farmer to expect ſucceſs with lucerne, unleſs he keeps it perfectly clean from weeds and graſs; and that it is planted in ſound, dry land that does not retain water, nor has any ſprings in it: for in ſuch land its tap roots are chilled, and ſoon rot, lucerne never thriving in ſuch ſoils, and rarely ſurviving a third year; whereas in a ſoil ſuitable to it, lucerne has been known to flouriſh above thirty years. It is much more difficult in point of ſoil than ſainfoin; lucerne requiring better land, and does not thrive in a very poor, dry ſoil. But notwithſtanding the difficulty of finding a proper ſoil for it, lucerne is a plant of ſo great value, that every farmer will find it much for his advantage to cultivate it extenſively, upon a good, deep loam, a little moiſt, but by no means wet or ſpringy.

Lucerne produces blue or purpliſh flowers, which are ſucceeded by ſmall flat pods, containing ſeed about the ſize of red clover, but longer, or more of the kidney ſhape. It has been cultivated in three different methods, viz. ſown broad caſt, as clover, in April, with about ſixteen pounds of ſeed to an acre. The land ſhould be well prepared for it, deep ploughed, and made very clean from weeds, as mentioned above for ſanfoin: But though the land is made very clean at firſt, weeds will ſoon riſe, and then the lucerne is harrowed to clean it; lightly harrowed the firſt year, but afterwards with ſtrong harrows to pull up the weeds, which ſhould be immediately carried off the ground. The roots of the broad caſt lucerne are ſmall, and ſo very hard and tough, that the harrows do not much hurt them; but as the weeds will multiply faſt, it is neceſſary to harrow the lucerne immediately after each cutting, and in the ſpring after the ground has been mellowed by froſt, for then the weeds are more eaſily pulled up by harrows. With this culture lucerne will produce three cuttings in a ſummer; and will laſt with care, and frequent manuring, for ſeveral years. It ſhould not be manured with farm yard dung, as that abounds with weeds. Aſhes of various kinds are proper, and if the land is marled, will greatly improve it. Fat, ſoft chalk, is alſo very good; ſuch chalk and clay marle are excellent for the light land to be planted with ſainfoin.

Another method of cultivating lucerne, is in drills, about 12 inches diſtant for hand-hoeing; the plants to be ſet out in the rows to ſix inches diſtance, or the rows two feet diſtant, and ſix inches in the rows, to be hoed with a ſmall plough; two pounds of ſeed is enough to drill upon an acre. In both theſe methods, the lucerne will yield better crops than the broadcaſt, (but moſt in the wide rows) and be fit to cut four or five times every ſeaſon.

A third method of cultivating lucerne is, by raiſing the plants in a ſeed bed in April, and tranſplanting them in Auguſt or September, cutting off the tap roots to about five or ſix inches long, and the tops within two inches of the crown. Lucerne has been thus tranſplanted upon ridges, three feet broad, one row upon each ridge, and the plants ſet at ſix inches diſtance in the row. It is then to be horſe-hoed every month, or as often as neceſſary, to looſen the ſoil and kill the weeds. But as in this way, the plants produce a very ſmall crop, the ſummer after they are tranſplanted, ſome of the plants die, and others are weakened, it is better to plough away the earth from one ſide of the row, (raiſed from ſeed in April, and ſet out to ſix inches diſtance) and then the roots of the plants may be eaſily come at, and cut about ſix inches below the crown in October. This is a very good method of planting lucerne, which will ſucceed thus in ſhallower land than the other ways, becauſe the mould is made deeper, by raiſing it in ridges, the weeds are effectually deſtroyed at a very ſmall expence by the hoe plough; and there is no method of culture, that ſo much improves the crop and the land as the horſe-hoeing. Above five tons of excellent hay have been obtained yearly, from every acre of land thus cultivated without manure: But it is beſt to dreſs the land planted in this and every way with lucerne, and the returns will be the greater. Fine manure, as aſhes, ſoot, pigeon dung, malt duſt, and other ſuch light manure, are moſt proper for this purpoſe, ſpread upon the ground frequently by hand.

Lucerne plants, thus planted and cultivated, produce heads, viz. a crown or bulb upon each plant, which ſpreads every year, and will the ſecond or third year ſpread to ſix inches diameter, and meet, forming upon the top of the ridge a broad row of ſix inches. The enlargement of the crown every year, conſiſts of a kind of offsets, joining to the original head of the plant, all which produce ſtalks above ground, and tap roots below; ſo that as the crown enlarges, the crops alſo encreaſe every year, till the crowns meet in the row.

This enlargement of the bulbs or crowns of the root, does not ſtop at ſix inches; but if the plants have ſufficient room and good nouriſhment, they go on till they are a foot in diameter, and ſome plants have enlarged to eighteen inches diameter; how much larger they will grow is not known. From this circumſtance however, the cultivator of lucerne may draw a further advantage; for the crowns may be encouraged to grow larger than ſix inches broad, by making the ridges broader, and ſetting them out to a greater diſtance in the rows. The plants at ſix inches apart (upon three feet ridges) occupy a ſixth part of the breadth of the ridge. If ſet at nine inches apart, upon ridges of four feet and a half broad, when the plants ſpread and meet, they will form a broad row in the middle of the ridges of nine inches broad; which is likewiſe a ſixth part of theſe ridges. And if the plants are a foot diſtant upon ſix feet ridges, the ſpace covered by the plants will be ſtill in the ſame proportion, or a ſixth part of the breadth of the ridges. The plants will enlarge to twelve inches broad in three or four years; and though they will not then bear a greater proportion to the breadth of the ridges, than the ſix inch plant bears to the three feet ridges firſt mentioned, yet they will yield greater crops; becauſe the broad ridges may be hoed much deeper, and the plants will be more vigorous, will produce larger, more juicy, and weightier ſtalks, and at leaſt five cuttings every ſeaſon, one with another; for by this culture they will be brought to high perfection. There is beſides another advantage in theſe broad ridges, a crop of ſavoys, or other cabbages, may be raiſed in winter, in the intervals between the rows of lucerne; and if theſe cabbages are forwarded, by giving the land where they grow a good dreſſing of compoſt, or other manure, the lucerne will be much benefited by ſuch manuring. This is the moſt profitable way of cultivating lucerne. Planting it on three feet ridges is alſo very profitable; it comes ſooner to a crop on theſe narrow ridges, and is eaſily hoed with a ſmall ſwing plough.

But as many farmers may chooſe to cultivate this plant, more conformable to their uſual method of tillage, I ſhall propoſe a way to them of clearing their land of the great enemies of lucerne, weeds, without the trouble of hoeing the rows on level ground, or of harrowing the crops ſown broad caſt; I mean by burn-beating the land, where they have that liberty. In burnbeating it is uſual to pare off the turf about two inches deep, and burn it in large heaps upon the land, with a ſmothering fire. If the land intended for lucerne is deep, it may be pared and burnt three or four inches deep, which will make many aſhes, and a rich dreſſing to the land. The farmer may then ſow the land in what manner he thinks beſt, and the lucerne will be in no danger from weeds for many years, if he takes care not to manure the land with dung, or other dreſſings that have the ſeeds of weeds in them.

The lucerne cultivated upon ridges, is not to be mowed and made into hay, (unleſs carried off, and made upon paſture ground fed down bare) becauſe the lucerne graſs is juicy, and falling upon the tilled ground, the earth and ſand would ſtick to it, and make it diſagreeable to cattle; and much more ſo, if given to them green, in that condition.

The moſt profitable uſe of lucerne, is to give it to cattle green, eſpecially to horſes, which are very fond of it, and it ſerves them both for hay and corn, though worked upon it. There is no ſort of graſs equal to lucerne for ſoiling horſes, and curing them of ſeveral diſorders. It is excellent food for all ſorts of cattle, and ſpeedily fattens them; it cauſes cows to give a great deal of rich milk; but no black cattle ſhould be fed with lucerne the ſame day it is cut, as then they eat it ſo greedily, that it ſwells or hoves them, given them when freſh cut; but they may eat it ſafely, in about a day afterwards. The lucerne growing upon ridges, or in wide rows upon level ground, ſhould be cut by hand with a hook. Hay may be made of lucerne, as before mentioned, upon ſome bare paſture ground; it ſhould be made with care, in the manner deſcribed for making ſainfoin hay, and ſhould be ſtacked, and laid in thin layers between layers of hay, or clean wheat ſtraw, and laid ſo that the lucerne hay ſhould not be expoſed to the weather. Laid in this manner it will keep well, and will communicate to the ſtraw, or the other hay, a flavour very grateful to all cattle. The lucerne hay is good to cure them of ſeveral diſorders; but the moſt general uſe of it is, to give it to them green; and of ſainfoin in hay.

CHAP. XIV

OF BURNET.

THIS plant was introduced into huſbandry by the late Mr. Roque, under the patronage of the London Society of Arts. It is a native of Britain, and ever green and perennial: has indented, winged leaves, riſes about a foot and a half high, and produces very ſmall reddiſh flowers, in round and oval heads. It is a plant of doubtful character, by ſome greatly extolled, and by others as much undervalued. One reaſon of this difference in opinion, is from a ſingular circumſtance, that cattle are fond of burnet raiſed upon ſome land, and raiſed upon other land, they will not touch it, though on a ſoil ſimilar in appearance: for this reaſon every farmer, inclined to raiſe burnet, ſhould ſow a little of it at firſt, to try his cattle with it, before he cultivates it extenſively.

It is raiſed from ſeed ſown in the ſpring, March or April, upon a dry ſoil; if ſown broadcaſt, twelve or fourteen pounds per acre was the quantity recommended, though that is much too large a quantity, if the ſeed is all good, which indeed it ſeldom is: nor much above half of it is ſo, of what I have raiſed myſelf and examined. The ſeed is contained in a brown huſk, having two cells, each containing one ſmall ſeed: ſometimes they both grow, but generally one of the ſeeds is imperfect, and ſometimes both. When the plants are come up, it will be neceſſary to hoe out the weeds ſeveral times the firſt ſummer, and perhaps the beginning of the next; but afterwards they will keep down the weeds, without further trouble; for they are very buſhy plants, and cover the ground. About ſeven or eight pounds of good ſeed are ſufficient for an acre broadcaſt; and half that quantity, or four pounds, if drilled in eight or nine inch rows, and covered about half an inch deep. It is then eaſily hoed, and grows ſtronger than the broadcaſt. The land ſhould be made clean for this ſeed, and brought into fine tilth. It has many roots, and does not root near ſo deep in the ground as ſainfoin.

Burnet ſeed was for ſome time ſold at a high price, two ſhillings a pound, about fifty ſhillings the buſhel; and as this plant produces ſeed about the end of June, and about forty buſhels an acre, and ſometimes a ſecond crop; moſt of thoſe who planted it at firſt, were ſolicitous to ſave all the ſeed they could, which reduced the price ſo much, that now the ſeed is no great object to the farmer. The ſeed is very apt to ſhed when ripe, and ſhould be cut with the dew upon it. If no ſeed is ſaved, burnet yields two good mowing crops, in the ſummer, for hay. The hay ſhould be made as ſainfoin hay.

But the principal uſe of burnet, is for food for cattle in the ſpring: for it is not hurt by froſt in winter, and even keeps on growing, more or leſs, according to the ſeaſon: ſo that if it is not fed after Auguſt, it will afford cattle a full bite in March. And if left ſeven or eight inches high in October, it will advance to nine or ten inches by the beginning of March, and its leaves then in full verdure. This is a ſingular quality in burnet beyond other graſſes, and very valuable at that early ſeaſon.

Burnet will ſucceed well, if ſown with barley, but ſtill better ſown with buck wheat: Burnet may be fed with great cattle or ſheep all the ſummer; and there are inſtances of its curing ſheep of the rot, if not very far gone in it. If fed it will not require much manure; but if cut often for ſeed or hay, ſome manure will be neceſſary, to keep the land in heart.

CHAP. XV.

OF TURNEPS.

THE different kinds of ſoil in moſt farms, is a circumſtance in favour of the occupiers of them, as they are ſuitable to different kinds of crops, and give the farmer a greater chance of good crops upon ſome of them, in variable ſeaſons. In graſſes particularly, whereof we have laſt treated, clover ſuits beſt with ſtrong, moiſt ſoils, ſainfoin and burnet with dry, and lucerne with loams of a middle quality. The farmer who is poſſeſſed of theſe, with proper cultivation, will have plenty of food for his cattle; of lucerne in ſummer, and in winter and ſpring, of clover; and of ſainfoin for hay; and burnet in ſpring, when the winter food begins to run ſhort. But keeping a good ſtock of cattle, and feeding them well, or fattening them for ſale, being of great importance to the farmer and grazier, in reſpect of profit, and in furniſhing abundance of manure: There are, beſides the meadows and paſtures of a farm, and the graſſes above-mentioned, ſeveral other articles that may be raiſed on every farm, which likewiſe contribute greatly to the ſame valuable purpoſes. Of theſe turneps have been longeſt in uſe in Britain, (though known before in Flanders) as very uſeful food for large cattle and ſheep.

Turneps are raiſed from ſeed, ſown about the middle of July, about a pound to an acre broadcaſt; the beſt ſoil for them is good barley land, a light, moiſt loam, well manured; they alſo ſucceed well upon other ſoils, good gravel, and ſandy land; and likewiſe upon ſtrong loams, made fine by good tillage, and manure. They are hand-hoed when they come into rough leaf, (viz. when they have four rough leaves) and ſet out by the hoe to the diſtance of about ſix or eight inches every way. When the weeds advance, hoe the turneps again, and ſet them out to a greater diſtance from fourteen to eighteen inches, or more, if large turneps are deſired; in wet ſeaſons a third hoeing may be neceſſary; for the land ſhould be well cleaned from weeds; and the oftener and deeper the land is hoed, the more it will be improved, much beyond the expence of hoeing. Some plough their turnep land into four feet ridges, after bringing it into fine tilth, then dung it well, laying the dung in the furrows; then plough back the ridges upon the dung, ſmooth the tops of the ridges with light harrows, and drill upon them a ſingle row of ſeed; the turneps grow thus as upon a hot bed, come up quick, and ſoon get into rough leaf; by which they better eſcape the fly, which is of much importance. The land may be dunged in the ſame manner for cabbages.

The turneps are fed off from November and December till the end of March; if they ſtand longer, they run to ſeed, (ſometimes earlier) and have then but little nouriſhment in them. In general, it is more profitable to feed them all off by the end of December, for till then, they are in a growing ſtate, go furtheſt in feeding, and are not ſo liable to be injured by froſt, as after they have finiſhed their growth; many fine crops of turneps are deſtroyed by froſt, in the ſpring months ſucceeding Chriſtmas. They are fed off by ſheep penned upon the land; firſt by ewes and lambs, next by ſtore ſheep, to eat up what the others have left; but this is a bad way, and much waſte made; or if the ſtore ſheep are confined, to make them eat up the turnep clean, they do not thrive upon ſuch turneps; becauſe tainted with the feet, dung, and urine, of the ewes and lambs firſt fed upon them. It is much better to pull up every day, the turneps to be fed off that day, and the ſheep will eat them clean up, or make very little waſte. The intention of feeding the turneps on the ground upon which they were raiſed, is to improve it by the dung and urine of the ſheep, and ſweat and warmth of their bodies in lying upon the ground; all which are beneficial to the land: But if the land is ſtrong or wet, penning them upon ſuch land will greatly endanger the health of the ſheep, by the rot; and in ſuch circumſtances the turneps ſhould be pulled up, and carried to ſome dry paſture, or other dry field that wants improvement; and there ſheep will eat them up clean, and without danger.

A great improvement may be made upon dry paſtures, by cutting them with the five-coultered plough, or ſcarrificator, and then feeding ſheep upon them with turneps and ſome of the beſt hay. The turneps ſhould be laid regularly every day, for the ſheep to feed upon the field equally, from one ſide to the other. The feet of the ſheep will break the turf after it is cut; and by treading in the dung and graſs ſeeds in the hay into the traces made by the coulters, the graſs will be very much improved, both in quantity and quality.

Turneps are liable to great damage from the fly, which often deſtroy whole fields of them in one or two days, by eating off the ſeed leaves; ſo that in ſome years, the farmers have ploughed their land, and ſown it a ſecond time with turnep ſeed, and even a third time, and have at laſt been diſappointed of a crop, by the fly. No certain method has been diſcovered wholly to prevent this misfortune; ſowing lime over the young turneps has been found uſeful, and rolling them, will deſtroy many of theſe inſects, and is a very good method, provided the turneps are hoed ſoon afterwards; for if that is long omitted the ground will be hardened, and the turneps irrecoverably dwarfed. Another and ſafe way to ſave the turneps, is to ſow them early upon land highly manured with warm dreſſing; this cauſes the turneps to grow up quick, and ſoon get into rough leaf; by this means they will have the better chance to eſcape the fly, for they generally attack only the ſeed leaves, which are very ſweet; but do not hurt the turneps that are advanced ſo far as to put out rough leaves. It ſeems they hover about in vaſt ſwarms, continuing a very ſhort time in one place, deſtroying whole fields of turneps ſometimes in one night, and the next day none of them to be ſeen; and hence it happens, that turneps ſown upon poor land, and not well manured, are moſt ſubject to be deſtroyed by theſe flies, as in ſuch land the turneps grow ſlowly, are longer in getting into rough leaf, and out of danger from theſe inſects.

The broad caſt is the moſt common way of ſowing turneps, but the hand hoeings are expenſive; and no work in huſbandry is worſe done in general than turnep hoeing. It is therefore a much better way, to ſow them upon four feet ridges, one row along the middle of each ridge: This is beſt performed with a drill plough, with which four or five ounces of ſeed will ſow the land as well as five times that quantity ſown broad caſt. If the owner thinks them in danger from the fly, they are much eaſier ſecured when thus drilled, than if they were ſown broad caſt, either by ſprinkling lime upon the rows, or, which is more effectual, by rolling the top of the ridges with a heavy roller, at the proper time, which will bury and cruſh the flies, without damage to the turneps, if they are hoed ſoon after.

The hoeing here meant is performed by the hoe plough, drawn by one or two horſes; the plough to go near the turneps, and turning the earth from one ſide of them, and then hoeing off the earth from one ſide of the adjoining ridge; theſe two furrows meeting in the middle of the intervals will form ſmall ridges there; and when one ſide of all the ridges are hoed in this manner, and has lain ſo till the weeds begin to grow, plough back the earth to the ridges, then hoe the other ſide of the ridges in like manner; and then return the earth to them again in two or three weeks. This alternative hoeing is neceſſary when the plants on the ridges are in ſingle rows: For if both ſides of a ridge were hoed away at one time, the plants would ſtand upon a narrow ſtrip of land; and at the ſecond hoeing, they would be in danger to be thrown down, by the plough preſſing upon one ſide of the row, and nothing to ſupport them on the other. Theſe alternate hoeings ſhould be repeated as often as neceſſary, to deſtroy the weeds, and bring the land into fine tilth. As the hoe plough cannot come cloſe to the turneps, a narrow ſlip of earth, of about two or three inches broad next to the turneps will remain unhoed. Theſe ſlips, and the earth in the row between the turneps, ſhould be pulled down into the furrows with hand hoes, with the weeds upon them, juſt before the earth is ploughed back to the turneps, by which theſe weeds will be buried, and thus entirely cleared off the whole ridge.

Some farmers, not accuſtomed to horſe-hoeing, may think it an expenſive and difficult operation; but this only ſeems ſo to thoſe who have not experience of it. The hoe plough, is a common ſmall ſwing plough (without wheels) and in hoeing, is drawn by two horſes, or oxen, at length; and no more difficulty in this hoeing than in common ploughing, and turning a furrow to or from ridge. And as two acres or more, may be thus hoed in a day, with two horſes, a ploughman, and no driver (no driver being neceſſary in this work) the expence of hoeing an acre of turneps with the plough, is not half what they coſt by hand hoeing; but of greatly ſuperior advantage to the crop and land, which experience has fully proved.

Turneps

Turnep ſeed may be ſown in rows pretty regularly, without a drill plough. If the ſeed is put into a corked bottle, and a hole made through the cork with a hot iron, ſo narrow next to the ſeed that only two or three ſeeds can paſs through there at once; and the other end of the hole made much wider, with the hot iron; the hole then will be ſhaped like a funnel, (narrow next to the ſeed, and gradually widening towards the outward end) and the ſeed will run through it regularly, and without obſtruction.

When the plants are come up, and have got four rough leaves, they ſhould be thinned in the rows, leaving the moſt promiſing plants at about five inches diſtance; afterwards thin them again to the diſtance of about ten inches, and at this diſtance they ſhould remain for a crop; which, if the ridges are well horſe-hoed, as above directed, will be a greater crop than is obtained by hand hoeing, as has been fully proved by experience, even where they have been drilled upon broader ridges than four feet, and ſet out farther diſtant in the rows than ten inches.

The uſual way of thinning broad caſt turneps, is with a hand hoe; but when thus ſown, many of the young turneps come up in cluſters, interwoven and entangled together, that it is impracticable to ſingle them out with a hoe; and if not ſingled out at the firſt hoeing, all the turneps that ſtand ſo thick will be ſtinted or dwarfed: for this reaſon ſome have thinned their broad caſt turneps by hand; which is done by taking hold of the maſter turnep in the bunch with one hand, and with the other hand gently drawing up all the other turneps in the bunch; and in this way turneps may be ſet out regularly at firſt, which will much promote their growth. Nor is the expence of thinning them in this manner ſo great as it may ſeem at firſt view. This method is eaſily put in practice in thinning drilled turneps, and is recommended as the beſt way of doing it the firſt time; and at the ſecond thinning the turnips will ſtand diſtinct, and are eaſily ſet out then with a narrow hoe, to the diſtance they are intended to remain for a crop.

Great cattle are fattened upon turneps; and when intended for them, the turneps are allowed room to grow large, and are ſliced for them. If the land upon which the turneps grow is at all ſtrong, the cattle ſhould not be fed there, but upon ſome ſound dry, paſture, to which the turneps are carried and ſpread, for the cattle to eat them up without waſte. Turneps being of a cold, water quality, the oxen fattened with them, are allowed ſome hay, about ſeven pounds of hay to each daily; and ſheep have hay with them in proportion; cattle and ſheep do not generally take to eating turnips well at firſt, but are brought to it, by mixing among them ſome that have been accuſtomed to eat them; and afterwards they are well fattened with turneps and ſome hay. By ſome accurate experiments made of fattening bullocks with turneps, it has been found, that they eat daily about half their beef weight of turneps, beſides hay; and ſheep eat about a quarter of their mutton weight. But the quantity they eat is not regular, for a fatting beaſt eats moſt when firſt put to be fattened, and leſs afterwards when near fat.

Turneps encreaſe the quantity of milk in cows, but give the milk and butter a diſagreeable taſte, which moſt people are ſenſible of at firſt; and therefore turneps are not reckoned proper food for cows in dairies where much butter is made, but do well where calves are ſuckled, as the taſte of the turnep is not perceivable in the veal.

Though turnep crops are not immediately ſo profitable as ſome others, and are attended with a conſiderable expence, of repeated ploughing and hoeing, yet are theſe no loſs to the farmer, he receives the benefit of them in his ſucceeding crops; whereof farmers are generally ſenſible, and the beneficial effects of tillage and hoeing in this caſe, ſhould induce them to give all their arable lands the moſt perfect tillage; for though ſuch land may be over manured to the farmer's loſs, he may be aſſured they cannot be made too fine by tillage.

Another advantage of the turnep huſbandry, is its cleaning the land; an object that ſhould be ever in view. All weeds are robbers, and where they abound, do infinite damage; they ſhould be conſtantly attended to, and extirpated out of all the lands of a farm, and no rank weeds ſhould be ſuffered to grow large, much leſs run to ſeed, either in the arable lands, or in meadows, paſtures, on dunghills, or odd corners of fields, banks, or hedges; for their ſeeds ſoon multiply, and ſpread over a farm; ſome by birds, and others wafted by the wind,

wind to a great diſtance; and the ſcouring of ponds and ditches are full of them. Clean and ſpirited huſbandry affords much ſatisfaction to a good farmer, and contributes greatly to his profit.

CHAP.

CHAP. XVI.

OF CABBAGES.

IT is of great importance in huſbandry, to provide plenty of food for cattle, and eſpecially in winter and ſpring, when there is very little food for them in the fields. The old farmers depended chiefly upon hay and ſtraw for their cattle in winter and ſpring, but were then often diſtreſſed to provide ſufficiently for them; for hay making in good ſeaſons is expenſive, but in rainy ſeaſons it is a buſineſs of much difficulty, and attended with a heavy expence to make meadow hay; and after all, the hay in theſe ſeaſons is often damaged, and not a little of it ſpoiled. The cultivated graſſes are now very properly introduced, and aſſiſt the farmer greatly in this reſpect; turneps for the ſame reaſon, are very valuable, but very ſubject to fail by the fly in autumn, and in winter and ſpring by froſt: for this reaſon other plants have of late years been cultivated in the fields, for feeding cattle in winter and ſpring; and among theſe cabbages are found to be of great uſe.

Coleſeed is much cultivated in the fen countries, chiefly for the ſeed to make oil; but this being a very hardy plant, is alſo valuable for cattle, ſtands the winter well, and in uſe for cattle in the ſpring. It is commonly ſown broad-caſt, and the plants are very ſmall; but if planted upon three feet ridges, a ſingle row upon each ridge at about a foot diſtant in the row, it riſes to a conſiderable crop if horſe-hoed, and is much liked by cow cattle and ſheep.

Many ſorts of cabbages have been tried, and in the North of England, the large Scotch cabbage extenſively; that ſort being preferred there on account of it's ſize, as in good land it arrives ſometimes to 40 pounds weight. They are ſo hardy that froſt ſeldom hurts them, and they laſt there from November to March, April, or later, according as they are raiſed early or late in the ſeaſon.

The ſeed of the great Scotch cabbage ſhould be ſown on a ſeed bed in Auguſt; about two ounces ſown upon ſix perches of land, will produce plants ſufficient for an acre of cabbages; and leſs would do, if the ſeed is drilled in rows ſix inches diſtant, and hoed between the rows: for the ſeed is ſmall, viz. about 6000 ſeeds in an ounce; drilling and hoeing them in this manner, is a better way than ſowing them broad-caſt, as the drilled plants are much the ſtrongeſt. Some let the plants remain in the ſeed bed till about Michaelmas, then tranſplant them into nurſeries, and in June tranſplant them again into the full ground, where they are to remain. Others tranſplant them from the ſeed-bed directly into the field; but it is better to tranſplant them twice, viz. firſt into a nurſerybed, and afterwards into the full ground; becauſe by tranſplanting they have better roots than if left long in the ſeed bed; where if they remain long they grow long ſhanked, and their ſhanks are apt to rot.

A ſtrong ſtiff ſoil is moſt ſuitable to cabbages, though they grow to a good ſize upon lighter, moiſt land, and produce from 20 to 50 tons per acre. The land ſhould be well manured for them with dung or rich compoſt; which being ploughed into the land, and well mixed with it, let the land be then ploughed up into four feet ridges, and ſet the plants upon the tops of the ridges, at two feet diſtance, a ſingle row upon each ridge. The plants may be ſet with a dibble; but it is a much better way to mark out by a line a ſtraight ſmall trench along the top of the ridge, and ſet the plants upright in the trench, ſpreading the roots in it; then fill the trench up with the mould that was dug out of it. This is ſome more expence than planting with a dibble, but greatly ſuperior to it; for the plants thus ſet in the trenches ſtrike root ſooner, and grow much more luxuriantly than if dibbled in; and therefore the farmer ſhould make it a rule to ſet all his plants in trenches, cabbages, and all others that are tranſplanted.

It frequently happens that turneps are deſtroyed by the fly, ſometimes after ſowing the ſeed twice or even three times, which is not only a loſs of the crop, but a great diſappointment to the farmer, in obliging him to change entirely the intended courſe of his crops, to his great loſs; in this caſe cabbages will be particularly ſerviceable, for they may be planted in good time inſtead of the turneps.

The farmers in the North of England ſometimes water their cabbages when they plant them: but this is not neceſſary when the land is in good order and in fine tilth, and the plants are ſet in a trench, as before mentioned, and planted in ſhowery or moiſt weather. It is the dibbling that makes watering neceſſary, for which there is no neceſſity if planted in trenches.

Cabbages may be planted upon level ground, but thrive far better upon ridges, and horſe-hoed alternately. The firſt hoeing from the ſides of two contiguous ridges, turning the earth into the middle of the interval, which will form a ſmall ridge there; at the ſecond hoeing the plough is to go in the ſame track as at firſt, which will make the furrows deeper, and nearer the plants; the plough at this ſecond hoeing ſhould be brought as near the row of plants as can be done, without tearing them out, and the furrows ſhould be made deep. The ridge in the middle of the interval may be thrown back to the rows of plants directly, or in ſome days afterwards, according to circumſtances of weather or conveniency. And thus the young cabbages will be delivered from the weeds, and have a well looſened, deep mould to extend their roots in on that ſide. Proceed next to hoe the other ſide of the ridges in the ſame manner; and before the earth is turned back to the plants, pull down the ſlips of earth next the plants into the furrows; which together with the weeds upon them, will be buried by the next hoeing, as directed in hoeing turneps. Theſe alternate hoeings are to be repeated ſeveral times during the ſummer, till the plough is ſhut out by the enlarging and ſpreading of the plants; always taking care to perform the hoeings in dry weather, and when the land is in a fit temper to be broken by ſuch tillage. If this is obſerved, and the hoeings well performed, the farmer will be pleaſed with the luxuriancy of his cabbages. If the ſeaſon ſhould be ſo wet that the hoe plough cannot be properly uſed, the weeds muſt not be ſuffered to grow large, but muſt be kept down with the hand hoe. Two horſes at length are commonly ſufficient for the horſe hoeing. So that the hoeings are done at a ſmall expence.

Though theſe cabbages when at maturity are very weighty, they do not ſpread much, but grow very cloſe, and as hard as the red pickling cabbages; and for that reaſon the diſtance here allotted them is found ſufficient, when planted upon ridges: and if in horſe-hoeing any of the outſide leaves are broken off, the loſs is inconſiderable; or if theſe leaves are gathered, and given to ſtore cattle, they eat them greedily, and thrive upon them. Large cattle, ſheep, and hogs are all fond of theſe cabbages, and oxen and ſheep are well fattened with them. They likewiſe cauſe cows to give a great deal of milk, which makes very good butter; but when given to them, all the outward decayed leaves ſhould be firſt taken off, otherwiſe the butter will have a bad taſte; but when the decayed leaves are taken off the butter is very ſweet, as has been fully experienced.

Theſe outſide, yellow, and decayed leaves ſhould be given to the ſtore cattle, for they eat them greedily, and thrive upon them.

In taking up theſe cabbages ſome draw up the largeſt firſt, and let the reſt remain to grow larger, and by this means they receive a greater weight of cabbages from an acre, than if they were drawn all up, the large and ſmall ones together; but notwithſtanding this advantage, the cabbages that are cultivated upon ridges, may be drawn up one or more rows at once, large and ſmall together; eſpecially early in the ſeaſon, as in November or December: for the ridges thus cleared of the cabbages may be immediately ploughed, and planted again with more plants of the ſame ſort, or with other ſorts, as green ſavoys, &c. which arrive at their full ſize in about three months after planting them upon theſe ridges; and by this means the whole ground will be cropped throughout the winter.

The times of tranſplanting above mentioned are in general the beſt, in order to obtain the largeſt crops in winter and in ſpring; but the cabbages will grow well if planted at other times; if earlier they will come ſooner into uſe, and ſooner go off; and the contrary if planted later: the quality of the land makes likewiſe ſome difference in the time of their maturity. When full grown they burſt and run to ſeed.

By this huſbandry, over and above the advantage of the cabbages, the land is ſo much enriched, that a great crop of corn may be expected after the cabbages, without new manuring it, or any other expence than once or twice ploughing, which is eaſily done when in ſo good order, as it is after ſuch a crop well horſe-hoed.

There are various plants of the cabbage kind, all of them very good food for great cattle and ſheep, and all proper for the horſe-hoeing culture. I ſhall here mention ſome of them. The garden cabbages in general are good to feed or fatten cow cattle and ſheep; but what we more particularly enquire after here, are the hardy ſorts, that are not hurt by froſt, or very little even in ſevere winters. Of theſe we may reckon the turnep cabbage, a plant that grows with an erect ſtem, which ſwells and has a round or oval bulb like a turnep, growing within two or three inches of the ſurface of the ground, upon the top of which are produced ſeveral open leaves of a green or purpliſh colour; theſe are good food for cattle, and ſo are the bulbs or ſwelling part alſo; but the bulb or turnep part is firmer than a turnep, and not ſo watery. The value of this plant does not conſiſt in the largeneſs of the crop it produces, for in that reſpect it is conſiderably inferior to turneps, but it ſtands the froſt much better, and remains ſound in ſeaſons that deſtroy all the turneps; and what recommends theſe plants to the farmer is, that they may be taken up in February (to clear the ground for another crop) and they will keep quite ſound till Midſummer or longer, even if they are thrown upon the ground and expoſed to the weather all that time.

The ſeed of the turnep cabbage may be ſown upon a ſeed bed in March, and tranſplanted in June into the full ground, upon four feet ridges, and ſingle rows about 18 inches diſtant in the rows, and horſe-hoed alternately, as above; ſome of them will grow to about 15 pounds weight, but upon an average the crop will be twenty tons or upwards per acre. They caſt their ſummer leaves in December and January, which then decay and drop off, and afterwards produce new leaves: but to prevent the loſs of the ſummer leaves, they ſhould be taken off in November, before they begin to decay, and given to cattle, but ſhould not then be paſtured with ſheep, as they will fall immediately upon the knob, or turnep part of the ſtalk, which is ſome inches above the ſurface of the ground.

The turnep-rooted cabbage, is a ſort lately introduced into Engliſh huſbandry, by Mr. Reynolds, a farmer in Kent; this has not large tops, but numerous roots of the tuberoſe kind, which root ſo ſtrongly, that they are with difficulty got out of the ground; and are ſo hard that they cauſe the mouths of the cattle to bleed that feed upon them, and ſhould therefore be waſhed and ſliced for them. Theſe roots have a warm taſte, but agreeable and nouriſhing to large cattle and ſheep. They ſhould be raiſed and cultivated as the turnep-cabbages, and are ſo hardy that no froſt hurts them; and the produce, including the herbage and roots, is greater than turneps. Their roots muſt be taken up with ſtrong forks, or ploughed up.

Mr. Reynolds recommends deep ploughing for theſe plants, and hoeing, and thought manure unneceſſary for them: however they will certainly be much benefited by manure. In very good land, indeed very thoroughly and repeatedly deep ploughed, Mr. Randall of York has raiſed great crops of the large Scotch cabbage without any dung or manure. Some years ago he weighed a whole acre of them in December, and they weighed above fifty tons. Such is the effect of perfect tillage.

Some years ſince a plant was introduced here from France called the Anjou cabbage. It is a tall upright plant, from 6 to 8 feet high, furniſhed all the way up with looſe open leaves. This plant may be raiſed from ſeed in Auguſt, tranſplanted in March, upon five feet ridges, in ſingle rows two feet diſtant in the rows, and horſe-hoed as the Scotch cabbages. This cabbage or colewort caſts its ſummer leaves in November and December, and puts out new leaves afterwards. The beſt way of uſing this plant is to feed off the leaves with ſheep before they decay, and they will eat off all the leaves clean to the height of about four feet; and theſe tall plants are excellent ſhelter for the ſheep and lambs which are very fond of theſe leaves, and they fatten well upon them. The leaves that grow above the reach of the ſheep are eaten greedily by horſes, which eat all the upper leaves without damaging the ſtems; and when the firſt or ſummer leaves are all eaten off by the ſheep and horſes, then all cattle are ſhut out till new leaves are produced, and again fed off as before. They continue to produce leaves in this manner all winter till May. They produce about ſeventeen pounds in the ſeaſon upon each plant, and near twenty tons per acre.

The green borecole is extremely hardy, and not injured by froſt; the ſeed is ſown in Auguſt, and tranſplanted in March, upon four feet ridges, one row upon each ridge, and one foot diſtant in the rows. They caſt their ſummer leaves in December and January, and produce new leaves afterwards, very ſmall, but much more numerous than before. Theſe leaves are ſo ſmall that it is too expenſive to gather them for cattle by hand; but are profitable if fed off with ſheep and lambs as they ſtand upon the ground; the largeſt of theſe plants riſe to about eight pounds, and at an average to about ſix pounds. The produce per acre is above twelve tons, which though not an heavy crop, is valuable, as they may be depended upon in the ſevereſt winters for ewes and lambs; and are within their reach when turneps are covered with ſnow, or bound in the ground with froſt. The green bore-cole is a dry, warm plant, and horſes are fond of it: ſo that probably it may be a good food for them in winter, together with ſome hay or corn. The leaves might be taken off and carried home for them, as the plants ſtand upright, and there will be room for a ſmall cart to go between the four feet ridges to gather the leaves and put them in the cart. But whether theſe ſhall anſwer or not for horſes, the following article certainly will.

There are ſome other kinds of winter cabbages, and many that come to maturity in the ſummer; as the large white, the long ſided, Batterſea, ſugar loaf, and others.

CHAP. XVII.

OF CARROTS AND PARSNEPS.

CARROTS are very hearty, nouriſhing food for horſes, great cattle, ſheep, hogs, and deer. Moſt of them will eat carrots raw, and are fattened with them when boiled; eſpecially if ſome barley meal, pollard, or ground buck wheat is mixed with them; and with theſe pigs may be reared, with very little milk.

Carrots are ſown broad-caſt, with about four pounds of ſeed to an acre. They have many ſmall hairs upon them, by which they ſtick together, ſo that they cannot be ſown even till the hairs are got off, by rubbing the ſeed through a fine chaff ſieve. The ſeed may then be ſown unmixed, by hand, in the ſame manner as turnep ſeed is ſown. The top roots of carrots penetrate deep in the ground, if it has been deep ploughed; but the ſmall fibrous roots that come out from the ſides all round the top, are very ſlender and weak, and are not able to penetrate into ſtiff land: and as theſe ſmall ſide roots being the mouths by which the whole plant is fed, they do not thrive in ſtrong land, but in light ſandy ſoils, through which the weak ſide roots can extend and draw nouriſhment. This is found true where carrots are ſown broad-caſt, and hoed with hand-hoes; but if carrots are ſown on ridges, and horſe-hoed, they will thrive upon ſtrong loams, becauſe the land is kept looſe and open by horſe-hoeing, and then the fibrous roots can ſpread and thrive in it, as well as they commonly do in ſands, and generally better; for loams are naturally richer than ſands. Another advantage in ridges is, that the mould in them is deeper than in the ſame land as it lies flat. The farmer is therefore adviſed to ſow carrots upon three feet ridges, upon which I have found they thrive well upon ſtrong loam; and would produce larger carrots upon broader ridges. The land for carrots ſhould be very well prepared by good tillage, and the land made very clean; it ſhould alſo be dreſſed with good compoſt, which is much preferable to dung for this crop. The land being in fine tilth, and dry, a couple of ſmall tines fixed in a light frame, three feet diſtant in the furrow between two ridges to make very ſhallow traces; one along the middle of each ridge, as marks to guide the ſeedſman, to ſow the ſeed ſtraight upon the tops of the ridges; and then ſprinkle the ſeed very thin and regular upon theſe traces; the hairs ſhould be rubbed clean off the ſeed before it is ſown, and then it may be done in the beſt manner with a turnep drill plough; but if the farmer has not ſuch a plough, he may ſow the ſeed with a bottle and cork, as adviſed for ſowing turnep ſeed; and without either of theſe, the ſeed may be ſown by hand, taking care to drop the ſeeds very thin, and as exactly as he can upon the marks made by the tines. Another perſon ſhould follow directly after the ſeedſman, and ſift or cover lightly the ſeed with fine dry mould, ſo that the ſeed may be covered but a little more than a quarter of an inch deep with the mould.

Carrot ſeed is long in coming up, ſometimes three or four weeks, and therefore ſhould be ſown early; the latter end of February is the proper time, or as early in March as the weather and condition of the land will admit; for late ſowing is an injury to the crop in ſeveral reſpects. As ſoon as the carrots are up, and have got a little ſtrength, they ſhould be thinned by hand, as directed for thinning turneps; which is much preferable to thinning them with a hoe the firſt time; ſet them out to about two inches diſtance in the rows; and when grown ſtronger, and the ſtrongeſt plants are diſtinguiſhable, they may then be thinned again with a very narrow ſharp hoe; and if neceſſary, thin them a third time, and now ſet them out to about five or ſix inches diſtance at moſt, which will be wide enough to ſtand for a crop. Every time they are thinned, the tops of the ridges ſhould be hoed cloſe to the rows of carrots, and to ſome inches diſtance on each ſide of the rows, which will deſtroy the weeds, looſen the earth next to the carrots, and encourage them to grow vigorouſly; and in order ſtill further to promote their growth, begin to horſe-hoe them early, the plough going within about three inches of the rows on one ſide; and then on the other ſide alternately, as before explained in the culture of turneps and cabbages; and carrots ſhould be deep hoed that their roots may run down deep. Theſe operations are light and eaſily performed, and at a much cheaper rate than commonly done by hand-hoeing the ground all over ſeveral times. The crop produced in this method will be more than twenty tons of carrots per acre, which will go further in feeding cattle than an acre of cabbages, and twice as far as an acre of turneps. The carrots may be taken up in autumn, and laid in dry ſand or earth till they are wanted. It is neceſſary to be careful to get good ſeed, and ſuch as is ſaved the autumn before it is ſown; for if it be kept longer, much of it will not grow; and therefore the farmer ſhould raiſe his own carrot ſeed, which he may do, by tranſplanting in ſingle rows ſome of the ſoundeſt and beſt roots, upon three feet ridges, and eighteen inches diſtance in the rows, the beginning of February, and horſe hoeing them deep and alternately; which will cauſe them to ſhoot ſtrong, and produce ſound and good ſeed.

The carrots are eaſily drawn up if a deep furrow is ploughed on one ſide of the row, for then they may be drawn up by hand, or with a ſtrong fork. Parſneps are cultivated in much the ſame manner as carrots, and will grow in ſtronger land. They are very nouriſhing roots; and not yet uſually cultivated in England for cattle, but are much eſteemed abroad for that uſe.

CHAP. XVIII.

OF POTATOES.

POTATOES are generally known to be a very nouriſhing food, for men and cattle. There are ſeveral varieties of them; the round yellow are a very good ſort for the table; and for cattle the round red, and they produce a large crop. They thrive in different ſoils, but beſt in light loams; upon which about four or five hundred buſhels per acre, may be reckoned a good crop; though on good land, well cultivated, they ſometimes produce double that quantity. Small roots are not beſt to plant, but thoſe of a middling ſize, about 300 roots to a buſhel; or large roots cut in pieces, with one or two eyes or buds to each piece. If the middle ſized potatoes are planted whole, upon four feet ridges, in ſingle rows, at fifteen inches aſunder in the rows, twenty nine buſhels are required to plant an acre; but if they are cut, each potatoe may make two ſetts, at an average; and then about 14 buſhels may plant an acre. The expence of the ſetts are only at firſt planting, as afterwards there will be potatoes enough for ſeed, over and above the crop before ſtated.

They ſhould not be planted immediately after they are cut, becauſe in moiſt land, or when rain ſucceeds ſoon after the cuttings are planted, they are apt to draw in the moiſture where cut, and become rotten; but laid in a dry place after they are cut, that the air may have free acceſs round them for ſome days, the ſides that have been cut get dry, and the ſkin grows over theſe places, which protects them from the wet. The land ſhould be well manured for potatoes, and the manure equally ſpread, ploughed in, and well mixed with the ſoil. The beſt manure for them is compoſt, ſuited to the quality of the land. Good crops may be obtained upon loamy ſoils, with little manure, if well prepared by good tillage. But if very large crops are expected, bring the land into fine tilth, and alſo manure it well; then plant the cuttings upon four feet ridges, a ſingle row upon the middle of each ridge, and ſet them at fifteen inches diſtance in the rows, and five inches deep; in the end of February, or beginning of March, and when advanced a few inches high, horſe-hoe them alternately, and keep the rows clean from weeds. If the ſurface of the ridges bind or grow hard, before the plants come up, harrow the tops of the ridges lightly to break the cruſt, that their broad leaves may the more eaſily riſe and penetrate through the mould; after which the horſe and hand-hoeings will keep the land looſe about them, and encourage them to grow ſtrong. The potatoes grow at the end of ſtrings iſſuing from the original root; and therefore if they were to be horſe-hoed cloſe to the rows at every hoeing, the hoe plough would cut off many of the potatoes from the root; to prevent this plough cloſe to the rows at the firſt hoeing, that turns the earth from them; and when a ſmall furrow of the earth is turned back again to the rows, let it remain there till the potatoes begin to appear through the earth; then run the plough cloſe to the potatoes, to looſen and deepen the mould there, and immediately plough back a ſmall furrow to them, they will then extend, and be ſeen coming through this freſh earth: By repeating this tillage, the potatoes will grow large, and produce a plentiful crop.

Another way of planting theſe middle ſized roots or cuttings is to drop them after the plough in deep furrows, laying them at about a foot diſtance in the furrow, and cover them with the next furrow about five inches deep, and thus throughout the field, planting one furrow and miſſing the next: Good crops may be got this way upon level ground, but they muſt be hand-hoed.

This method may be improved, by ploughing the land level; and after it has been well tilled and laid ſmooth, make ſlight traces with a ſmall plough or frame, that has two tines in it, at the diſtance the potatoes are to be planted; as ſuppoſe three feet or more, draw parallel lines at that diſtance with the tines, and place the ſetts upon the lines; then plough the furrow towards the ſetts on one ſide, and another furrow on the other ſide of them; theſe two furrows meeting upon the ſetts, will form a ridge upon them, which ſhould be about five inches deep in mould; (or more at firſt, and harrowed down to that depth above the ſetts,) proceed in this manner throughout the field, which will by this means be planted in regular ſtraight rows, all at one equal depth, and may be hoe-ploughed, as if the ſetts had been planted upon ridges. Potatoes planted in this manner in rows, are eaſily taken up by once or twice ploughg the rows.

There are ſeveral other methods of planting and cultivating theſe roots, but inferior to theſe, and theſe methods are intended for land in good tilth; but they are alſo ſometimes planted upon waſte, uncultivated lands, to improve them. As ſuppoſe it is a poor ſoil covered with heath; the heath is firſt burnt, and the land marked out in beds, about four feet wide, and alleys between of two feet wide, or more; the ſetts are then laid on the bed in rows a foot diſtant, upon litter or fern, and the turf being pared off the alleys with a ſpade, half of it is laid upon each ſide of the beds, and the ſpace between the turfs covered with mould out of the alleys. Dung is better than litter or fern, and ſometimes lime, if it can be got. If the following ſeaſon happens to be wet, very good dry potatoes are got this way; and by the fermentation, excited by the mixture of theſe different ingredients, the ſurface of the land is mellowed, and prepared for ſome other crop: But that crop ſhould not be corn of any kind, for that will again impoveriſh the ground; it ſhould be ſome meliorating crop of graſs or roots ſuitable to the ſoils; and if theſe meliorating crops are repeated, in order to raiſe manures for the land, theſe, and good tillage, will make a laſting improvement of poor land.

The tillage for potatoes is the more particularly inſiſted on here, as theſe roots are great improvers of land, and one of the moſt profitable crops the farmer can cultivate at large in his fields; and the culture of them has nothing difficult in it.

CHAP. XIX.

OF MANURES.

THE two principal means of improving land, and reſtoring it when exhauſted, are tillage and manuring. Of the firſt we have briefly treated already; and with regard to manures, one of the moſt general is folding with ſheep, which of late ſome farmers have continued throughout the winter. This, however, ſhould never be practiſed upon cold or wet land, nor upon any ploughed land, otherwiſe the flock will be in great danger of the rot. If they are at all folded in winter, it ſhould be upon very dry paſture, which may be thereby highly improved, eſpecially if the ſurface of the land is firſt cut with the five coultered plough, or ſcarificator. The turneps go alſo much further this way, than if fed upon the land where they grow, though pulled up for the ſheep; for there they always make ſome waſte, but eat them up clean, if given them upon ſound dry paſture ground; where it is not neceſſary to confine them in a fold, but to throw down the turneps out of the cart regularly every day, upon a freſh place adjoining to the former, where the ſheep will feed, and the manure will thus be ſpread equally over the ground; whereas upon the turnep field they muſt be confined in a fold, to eat up the turneps there, and prevent their rambling over the reſt. A little hay in racks, placed regularly upon the paſture ground, and moved every day with their turneps, will be of great ſervice, particularly for ewes and lambs, and fatting ſheep.

The uſual time to begin folding ſheep is in May. Fatting ſheep requires moſt room in the fold; ſome farmers allow three ſquare yards to each, and fold only once in a place; and to other ſheep they allow two ſquare yards, or but one. The manure of well fed cattle of all kinds is much richer than that of the lean or poor. The beſt rule, is to give the land a thorough good dreſſing; for two acres well dreſſed, will be more profitable to the farmer, than three or four acres dreſſed ſuperficially; and it is eaſy for him to ſee, when the land is well and thick covered with this manure.

But though land may be well dreſſed with the fold, and it is a cheap dreſſing, yet ſheep are ſo delicate tender animals, that they are in great danger of the rot, and other diſtempers, by folding them in cold or wet land, or other miſmanagement. A careful ſhepherd will guard againſt many dangers, but a ſmall flock will not anſwer the expence of a ſhepherd. It is therefore a ſafe way to feed and ſhelter the ſheep at night in a ſheep yard, and let them out upon a dry paſture the reſt of the day. In this way they may be regularly fed, out of danger; and if their yard is well littered, they will make more manure than in any other way.

It

It is almoſt within memory that turneps were firſt cultivated for cattle; and in many parts of England they are yet not hoed at all, or very imperfectly. The chief dependance of the old farmers in winter was upon hay, which was very expenſive. Among many inſtances of this it may be ſufficient to mention Litchfield farm, near Andover, in Hampſhire, one of thoſe taken notice of by Mr. Liſle, where a large flock of ſheep was kept, and in hard weather in winter were kept upon hay; whereof, when the weather was very ſevere, they uſually eat a ton a day. The farmer brought part of his hay about fiteen miles off, and it coſt him from 50s. to 3l. per ton; and even with this aſſiſtance, the ſheep were too ſparingly fed; and it was not uncommon there, and in all the hill countries, for the flocks to be much diminiſhed in hard winters, ſome ſtarved, and many ſtinted. Nor did the misfortune end here; the ſheep and lambs muſt be turned upon the wheat in the ſpring, alſo upon all the forward graſs, to the irreparable damage of the next hay crop; yet in no long time after the clover and turnep huſbandry was practiſed in that country, the occupier of this farm had hay enough for all his cattle, and ſome to ſpare.

In order to have the full benefit of the manure, the farmer ſhould have a yard for his cattle, with a cloſe hard bottom, in the form of a baſon, higheſt at the ſides, and a little ſhelving gradually to the middle, that all the run of the yard may go that way, and none of it be loſt, this being ſome of the richeſt of the manure. The bottom of the farm yard ſhould be kept well bedded with ſtubble, ſtraw, or fern (which laſt makes excellent manure) and in this manner great quantities of manure may be raiſed, which when intended for any of the lands near the homeſtead, the bottom of the yard ſhould be covered all over with marle, chalk, clay, ſand, or loam, ſuited to the land to be manured; the layer of earth ſhould be covered with ſtraw, &c. and the cattle foddered thereon. The cattle will tread, mix, and incorporate them together, and make an excellent compoſt; upon which other layers of earth, ſtraw, fern, &c. may be added; then laid up in heaps, and when once or twice turned, and every time well moiſtered with the run of the yard, will be fit dreſſing for any land that is to be cropped with turneps, carrots, cabbages, &c. to be hoed.

But of corn crops, or land not to be hoed, great care ſhould be taken to avoid as much as poſſible to lay any ſtubble, dung, or other manure upon them, that contains the ſeeds of weeds; as they will fill the land full of weeds, the greateſt enemies to the farmer, and the moſt difficult to be extirpated; and therefore, if he would be cautious in this matter, and ſave himſelf much trouble and expence, with regard to weeds, his beſt way is to have a ſeparate yard, in which he feeds his cattle with turneps, cabbages, carrots and potatoes, and to litter that yard with fern only, or ſuch as are free from weeds; and not with ſtraw or ſtable dung, which is commonly full of them. One other ſort of food which has not this inconveniency attending it, is graſs cut and given to the cattle green; which is not yet practiſed by farmers, but would be greatly for their profit to practice it extenſively; for it has been found by trials made at large, that graſs mowed and given to cattle green, will go a great deal further in feeding them at houſe, or rack in the yard, than if they eat it off the ground; the difference is ſo great, that an acre of graſs cut, and given to them green, will feed more than four times as many paſtured upon the ſame extent of ground: Or, which amounts to the ſame, one acre of clover, or other graſs, mowed and given green, will go as far in feeding cattle, as four acres of the ſame graſs fed. This is a ſurpriſing difference; but the fact is certain, to a greater degree than here mentioned, and even as five to one. The cattle refuſe to eat the graſs they have trampled, or breathed upon, but when cut for them, they eat it up clean and make no waſte; provided the graſs is cut while it is in ſap, freſh, and young, or not paſt its prime.

In mowing the graſs, it ſhould be cut very cloſe to the ground; for otherwiſe, what is left is a great damage to the next cutting, and obſtructs its growth: But when mowed cloſe, the young graſs ſprings up quickly, and grows faſter then, than it does when further advanced; and for this reaſon alſo, there is no leſs in quantity but an advantage in cutting the graſs before it arrives to its full growth.

This a circumſtance of great importance, whereof every farmer may avail himſelf: He may feed all his cattle in the farm yard, with graſs mowed for them in ſummer, and with cabbages, and the other greens and roots above-mentioned, in the winter; his cattle will be regularly fed, and out of danger, and his own crops and fences, and his neighbours, will be ſafe from damage by his cattle, and he will gain a vaſt quantity of manure. He will want very little paſture for his cattle; a few fields, or a common will be neceſſary for them to range in for air, and keep them in health; but their food ſhould be in the farm yard, where they ſhould be regularly fed twice a day, and have plenty of freſh water there to drink when they pleaſe. The clover, as the meadow graſs, may be cut and given to the cattle; and the farmers chief dependance for hay will be on ſainfoin, which is made at leſs expence and hazard than clover or meadow hay, and is at leaſt equal to either of them in quality; the ſainfoin hay well ſaved, being one of the beſt ſorts of hay in the world. It is not yet certain from experiment, whether natural graſs mowed, and given to cattle green, will make them fat; but it will keep them in fleſh, and cauſe cows to give abundance of milk. In ſhort, this is a moſt valuable ſyſtem of huſbandry, and cannot fail of being very beneficial to the farmers who ſhall adopt it. But let not the farmer, who by this means ſhall obtain great plenty of manure, be tempted to neglect tillage, or perform it ſuperficially; but let him give his arable land perfect tillage and hoeing, the ſame as if he had but a moderate proportion of manure; keep his land perfectly clean, and in good tilth; ſow early, and uſe ſeed ſparingly: With this management he may expect good crops, without impoveriſhing his land.

Graziers, who are in the practice of fattening cattle with turneps, know well the profit of them, and how far they will go in fattening bullocks or ſheep; but the profit of the cabbages, and other crops introduced of late years is not generally known to farmers; which, however, is of uſe to them to know. The following are ſome accurate trials that have been made, to diſcover the feeding quality of ſeveral plants given to cattle, to feed or fatten them.

CHAP. XX.

OF FOOD FOR CATTLE.

IT is of conſequence to a farmer to know, what kind of plants it is moſt for his intereſt to cultivate, as food for his cattle. Of this we have already treated in part, ſo far as relates to thoſe plants that have been long in uſe; but there are ſome others, not long introduced into Engliſh huſbandry, which the farmer ſhould be acquainted with particularly, they being very valuable; the principal of theſe are turneps, cabbages, carrots, and lucerne.

Turneps, though long in uſe for feeding cattle in many parts of the kingdom, are not yet univerſal; and the beſt method of cultivating them, and their value in feeding cattle, is in many parts but imperfectly known. If drilled upon four feet ridges, and horſe-hoed, the crops at an average may be reckoned about 30 tons per acre; whereas when ſown broad caſt, and not hoed at all, the crops do not amount to ten tons the acre, and frequently not to half ſo much.

Cabbages of all kinds are much liked by cattle: The crops are various, thoſe of the great Scotch are the largeſt, riſing from 20 or 30 to 50 tons per acre: About 30 tons average.

Carrots are likewiſe much liked by all ſorts of cattle, and by horſes and hogs; and the crops of them 20 tons or upwards.

Lucerne is alſo a general food for cattle, it makes excellent hay; but is moſt conveniently uſed green, for ſoiling horſes, and for feeding and fattening oxen and ſheep. The produce, when tranſplanted upon three feet ridges, and horſe-hoed, has been 40 tons green per acre; and if well cultivated in that manner, and dreſſed with ſoot, peat or coal aſhes, or other ſuitable manure, laid on frequently, and in ſmall quantities at once, the average produce is about 30 tons per acre.

If the feeding quality of theſe plants were equal, and a ton of one of them went as far in feeding or fattening cattle, as a ton of the other, the farmer would be immediately determined in his choice, which of them would be moſt adviſeable for him to cultivate; but though they are all good and wholeſome for cattle, they do not all nouriſh cattle in equal degrees, which renders it neceſſary to make a farther enquiry concerning them.

By ſome accurate trials it appears, as obſerved above, that an ox conſumes about half his (beef) weight of turneps in twenty four hours, beſides about ſeven pounds of hay.

Of cabbages, and cabbage turneps, he eats about three eights of his beef weight.

Of carrots, according to Farmer Billing's experiments, cattle eat daily about half the quantity, as of turneps; and in that proportion, an ox eats of carrots daily about a quarter of his beef weight.

Of lucerne it has been found, that an ox eats, without waſte, about a ſixth part of his beef weight in twenty four hours; hence it appears, that of theſe different kinds of food, green lucerne is the moſt nouriſhing to cattle, and turneps the leaſt ſo.

If the produce of an acre of each of theſe crops, was conſumed by ſmall bullocks, of four hundred weight each, they would be ſupplied with food from theſe crops, in the following proportion:

An Acre of				Days.
Turneps of 30 tons would feed 10 ſuch bullocks				30
Cabbages of 30 tons,	—	ditto	—	40
Carrots of 20 tons,	—	ditto	—	40
Lucerne of 30 tons,	—	ditto	—	90

In calculations of this kind, exactneſs is not attainable, nor is it aimed at here. But from hence it appears plainly, that lucerne is an extraordinary rich food for cattle, much more ſo than any of the others; for if it was ſuppoſed, that the average crops of turneps, cabbages, and carrots, were twice the quantity here ſtated per acre; yet lucerne, even upon that ſuppoſition, is more profitable than either of them.

It is therefore the intereſt of the farmer to cultivate lucerne extenſively, as ſummer food for the dairy, and for fattening cattle; there is no food that will cauſe cows to give more milk or of a better quality; and with reſpect to fattening, lucerne is very profitable, for it is ready to begin cutting in April; a very convenient time to finiſh fatting the cattle that are then but half and three parts fat, and to begin fatting at that time upon lucerne, as in that caſe they will be fat in July and Auguſt, and then ſell at a good price, before the common graſs fed beef and mutton are fat, and fit for market. Green lucerne is alſo the cheapeſt feeding for the farmers horſes, whereof about 90 pounds a day is found ſufficient for a working horſe, without either hay or corn.

Fatting ſheep do not eat ſo much in proportion as oxen. They eat but about one quarter of their mutton weight of turneps in twenty four hours, and rateable of the other kinds of food.

Carrots and potatoes are good to fatten hogs. Mr. Young in his eſſay upon hogs, relates the following experiment he made of fattening them with different kinds of food, as follows: p. 45.

"In January 1766, I drew from the herd ten hogs, as equal in ſize as poſſible, and weighed them alive in five lots.

	ſt.	lb.
No. 1, weighed	13	4
2,	12	6
3,	13	0
4,	12	11
5,	13	1

A nearer equality than this, in matters that can neither be added to nor diminiſhed, can ſcarcely be expected.

No. 1, was fatted with white peaſe, that weighed 66 pounds per buſhel; the price 30s. per quarter.

No. 2, with pollard, that weighed 22 pounds per buſhel; the price 9d. per buſhel.

No. 3, with buckwheat, that weighed 47 pounds per buſhel; the price 2s. 3d. per buſhel.

No. 4, with boiled potatoes, that weighed 54 pounds per buſhel, the price 2s. per buſhel.

No. 5, with boiled carrots, that weighed raw 55 pound per buſhel; the price 1s. 1d. per buſhel.

I thought it beſt to fix on a given ſum, as proper to fat each hog. The people I conſulted were of opinion, that eight buſhel of white peaſe were neceſſary to fat one ſuch hog well. This I accordingly fixed on as my criterion. The account of the expence therefore ſtood thus:

			l.	s.	d.
No. 1,	Peaſe 16 buſhels,	—	3	0	0
2,	Pollard 80 buſhels	—	3	0	0
3,	Buck-wheat 27 buſhels	—	3	0	9
4,	Potatoes 28 buſhels	2l. 16s.	3	0	0
	Labour and coals —	4			
5,	Carrots 49 buſhels	2l. 13s. 2d.	3	0	0
	Labour and coals —	6 10			

Each lot was weighed as ſoon as the food was done; the reſult was as follows:

		ſt.	lb.
No. 1,	weighed	27	6
2,		27	9
3,		29	13
4,		25	7
5,		31	0

It is evident from this experiment, that carrots boiled are ſuperior to any other food. I did not expect that potatoes would be ſo much inferior; but I have found, from divers other trials ſince, that it is requiſite to mix the meal of ſome kind of corn with them. Pollard in this trial, as in the laſt, is ſuperior to peaſe."

The management, feeding, and fattening of hogs, are matters of conſequence to a farmer, and this curious experiment will be ſome guide to him, in providing food for them; but he ſhould be cautioned againſt a miſtake made by the author, with regard to the fattening quality of potatoes, which is not inferior to the carrots in the experiment, but the contrary: for it appears that 28 buſhels of potatoes, advanced lot No. 4 in fleſh 12ſt. 10lb. and lot No. 5 was advanced 17ſt. 13lb. by 49 buſhels of carrots. Now if the ſame quantity of potatoes was to be given to lot No. 4 as was given the other of carrots, that lot would have advanced 22ſt. 3lb. ½ inſtead of 17ſt. 13lb. that the carrots did advance No. 5, which ſhews that potatoes, buſhel for buſhel, is a more nouriſhing food for hogs than carrots.

If, indeed, the compariſon was by the acre, the carrots might have the advantage conſiderably; as a weightier crop of carrots may be obtained from an acre, than of potatoes; but they are both very valuable crops. Another circumſtance in this experiment unfavourable to potatoes, is their being charged at 2s. per buſhel, a very high price in the country, by the buſhel; and certainly much higher than the average price throughout the kingdom. The farmers profit, will be in proportion to the expence he is at in raiſing theſe roots; which conſidering the quantities of them produced per acre, is very inviting, even in this application of them; and when propogated for ſale at market, they are both highly valuable.

THE END.

APPENDIX.

CHAPTER I.

Of Different Soils, and the Manner of treating them.

THERE are ſo many different ſoils, and ſome of them intermixed with each other, that it is often difficult to diſtinguiſh them; and although this may be applied to nations in general, yet experience ſhews that the ſame difference often takes place in ſingle farms. Thus, if a farm is of any conſiderable extent, ſome parts of the ground will be marſhy, other parts dry, and ſome heath or uncultivated, each of which muſt be cultivated in a proper manner, otherwiſe the farmer has no right to expect any benefits from his labours. To enter into a phyſical inveſtigation of theſe ſoils, is entirely foreign to our purpoſe, nor would it be of any ſervice to the farmer, who, living moſtly in the country, acquiring his knowledge from practice, in the cultivation of the earth; ſo that all we have to do, is to point out ſuch plain directions as cannot fail of promoting agriculture, and ſecuring the advantages which an induſtrious huſbandman will enjoy, if he attends to his duty.

Of all the ſoils in this kingdom, the richeſt and moſt fertile is that which is ſoft and crumbly; when turned up by the plough or ſpade, it has much the appearance of the freſh earth thrown upon a mole-hill, and is ſometimes red, and ſometimes of a blackiſh colour, but is never hot nor cold, being of an excellent temperament between both. When the farmer intends to cultivate ſuch a rich ſoil as is here deſcribed, he ſhould attend to it with the utmoſt care, and he will find it the moſt proper for him to begin his experiments upon; and although it does not require ſo much aſſiſtance from art as ſome other ſoils, yet frequent ſtirrings and hoeings are neceſſary.

This ſoil never wants draining, unleſs the ſeaſon has been ſo rainy that it is overflowed with water, which generally runs from higher grounds nearly adjoining to it; and except when ſuch a circumſtance takes place, it may be ploughed at all ſeaſons; for within a few days after the water is drained off, it will appear looſe and mellow when turned up by the plough or the ſpade. It is neceſſary to obſerve, that this ſoil has nothing in it of a gluey ſubſtance, nor any mixture of clay; nor will it clog the ſhoes after rain. When it is turned up by the plough, the fragrance of the ſmell is extremely refreſhing, and often of great benefit to ſuch as are of a conſumptive habit of body.

The marley ſoil is the next that deſerves the attention of the farmer, and in many reſpects it differs from the former, although it is often found to be as rich and fertile. The marley ſoil is of ſuch a ſticking, gluey nature, that if a perſon walks over it after rain, he will be in danger of looſing his ſhoes, and it requires great care in managing; for, were it to be ploughed in a rainy ſeaſon, it would have the appearance of water; nor would it yield any thing of a crop, if ſowed after that ploughing. It is much ſubject to weeds, and therefore ought to be frequently fallowed; and as there are various kinds of it, the farmer ſhould endeavour to make himſelf well acquainted with them. In the cultivation of this ſoil, chalk ſhould never be mixed with dung, but chalk and clay, properly mixed together, will temperate each other; and where the farmer has an opportunity of procuring ſuch materials, it will be neceſſary for him to try the experiment. When the froſt has affected a bed of clay, it will crumble like a fine mould after a thaw, for the moiſture within the clay being diſſolved, the different particles fall to pieces, and loſe their connection with each other.

Thoſe farmers who have an opportunity of procuring chalk as a manure, ſhould break it ſmall about Michaelmas, and leave it expoſed to the cold during the ſeverity of the winter: when it begins to run, let it be ſpread, but let the undiſſolved parts remain till they are properly ſoftened, otherwiſe they will be of no ſervice to the ground; but if this method is attended to, there is not the leaſt doubt but the farmer will reap a conſiderable benefit, for it has been tried in a long ſeries of experiments.

In many parts of England there is a chalky ſoil, which muſt be managed in a manner peculiar to itſelf, as indeed all other ſoils ſhould, and to acquire a perfect knowledge of thoſe things, is great part of the farmer's buſineſs, who has any intention of promoting his intereſt by induſtry. Clay is the beſt manure for a chalky ſoil; but then it muſt be attended to, that ſome others are extremely uſeful, for either dung or marle may be of ſervice in producing very good crops for two or three years on a chalky ſoil; for dung generally expends its heat with great violence at firſt, but conſequently it ſoon looſes the whole powers of vegetation, ſo that a conſtant repetition of it as a manure becomes abſolutely neceſſary. On the other hand, as chalk is impregnated with fire, it operates in a more gentle and uniform manner, and will remain in the ground many years, unleſs when too often diſturbed by ploughing.

There is another ſoil with which every farmer ſhould ſtudy to become acquainted, namely the ſandy; and the rather becauſe that is common in many parts of England, and ſometimes whole farms are compoſed of it. It is known from long experience, that it requires great care to cultivate this ſort of ground; but by proper methods being uſed, it may be cultivated to conſiderable advantage. It ſhould be firſt ſowed with carrots, then with buck-wheat, and laſtly with burnet; after which it ſhould be ſtocked with milch cattle; but in many caſes the culture of burnet for only two years will anſwer the end, for experience teaches us, that as horſes will eat carrots and become fat upon them, ſo there will be the leſs neceſſity for oats. Thoſe who would cultivate carrots to the beſt advantage, ſhould break up the ſandy ground about Michaelmas; but as that has been already taken notice of in another part of this work, there will be no neceſſity to repeat it here.

The black boggy ſoil, and the peat bog requires much trouble to cultivate them, and yet perſeverance will overcome every difficulty, as appears from ſeveral experiments that have been made at different times. It has been a common practice for many ages, to burn ſuch ſorts of grounds; and although that method may be ſometimes attended with beneficial conſequences, yet it is much more proper to drain it, and to plant it with poplar, elders, or willows, while the intermediate ſpace ſhould be cultivated with ſalt, which will bring it into fine meadow land. Foul ſalt may be had at a ſmall expence, eſpecially when we conſider the drawback that is allowed upon it; but then as a manure it ſhould be uſed ſparingly, rather to kill the roots of noxious weeds, than for any other purpoſe; that being one of the firſt things that a farmer ſhould attend to.

There is another ſoil very common in this country, and yet it has never been properly attended to, namely that which is called brown caking; becauſe that, in a wet ſeaſon, it imbibes the rain in a moſt plentiful manner, but in a few days afterwards it is ſo cruſted over, that young plants cannot take any root in the ſurface. By this the growth of the plants are retarded, becauſe the moiſture is diſcharged too precipitately, ſo that the ſoil is either too wet or too dry, according to the uſe of the means, or the neglect of them in the cultivation. When it is turned up, it has generally a dry, mouldy appearance, without moiſture; and if there has been no rain, then it is crumbly, and falls into ſmall pieces.

With reſpect to this ſoil there is nothing ſo ſerviceable as marle; becauſe when immerſed in water, it diſſolves into a fine powder, in diſtinct particles, and is never again united into one body. Dung ought to be added to marle where it can be procured, for both together are generally attended with the moſt beneficial conſequences. Long experience has ſhewn, that a ſmall quantity of freſh dung, mixed with a double quantity of marle, will have more effect on this ſort of ground, than any ſort of manure that has been hitherto thought of, and the more rotten the dung is, the better.

The gravelly ſoil is the next to be taken notice of, and it is well known that there is much of it in England, and although this ſoil requires much care in the cultivation, yet it often produces good crops; particularly of oats, barley, vetches, and buck-wheat. The beſt manure for it is rotten dung, mud from ponds, clay, marle, and loamy earth; but unleſs they are laid on in large quantities, they will never be beneſicial in the end. They ought to be properly mixed together, and when they have laid two or three weeks in that ſtate, they ſhould be ſpread upon the ground at leaſt two inches deep, becauſe that gives the ſoil ſtrength to nouriſh the ſeeds ſown in it, and removes the ſterility peculiar to it. Clay and ſand mixed together, are of much ſervice in the cultivation of this ſort of ground; and where they can be had, they may be uſed to great advantage.

CHAPTER II.

Of the Catile neceſſary to be purchaſed for a new Farm.

IT is well known that a farm cannot be managed without cattle, and therefore it is neceſſary that great care ſhould be uſed in the choice of them, eſpecially in thoſe who enter upon farms that have not been properly cultivated; for if the difficulties attending that are once got over, the young beginner will be in the highway towards procuring a fortune.

In the choice of horſes, it is neceſſary that they ſhould be as much as poſſible of the ſame age, ſize, and ſtrength, otherwiſe they will never go on in their labour in a proper manner; for while the one is ſtronger than the other, nothing but confuſion will take place, and buſineſs will be retarded inſtead of being forwarded. It is likewiſe proper that the horſes ſhould be marked, not only to diſtinguiſh them as the farmer's property, but alſo to make his name known in the neighbourhood where he lives.

It is neceſſary that the young farmer ſhould make himſelf acquainted with the value of horſes, for if he truſts to dealers he will be in great danger of being cheated; and it is a melancholy reflection, that we can ſeldom truſt our fellow-creatures. In order to form a proper judgment of a horſe, he ſhould firſt take a view of him in general, and then deſcend to the more minute parts, and compare each with the other. The age of a horſe is eaſily known by looking at his teeth in the under jaw bone, where the laſt tooth is ſhed, and it is always the leaſt and whiteſt till the horſe comes of full age, and then no difference can be diſcovered, becauſe all ſeem alike. When a horſe is ſaid to be full mouthed, the meaning is that he is full grown; but as he advances farther in years, his upper teeth grow long, and project over the lower; but ſtill there are ſome deviations from this rule, for ſome horſes will bear their age better than others.

Horned cattle are the next to be conſidered after horſes, and it is certain that each are beneficial in their kind. If the farmer wants oxen for the plough, let him purchaſe ſuch as have been accuſtomed to that ſort of labour before, but let him take care that they be not too old; leſt when joined with young ones in the ſame yoke, they ſhould draw unequal, and conſequently his buſineſs would be retarded. A good ox for the plough ſhould be of a full ſize, his ſhoulders broad, his back ſtreight and well made, his thighs round, his joints ſhort, his horns wide, his hoofs deep, and his hair ſmooth and ſleek.

It is true, there are ſome farms that can be cultivated without oxen, but then there are many more which require the aſſiſtance of thoſe animals. The truth is, oxen were uſed in the earlieſt times; and it is certain, that all the improvements made in the new huſbandry, have not in the leaſt ſhewn that horſes ſhould be preferred to them, except on extraordinary occaſions.

Cows are in many reſpects as neceſſary as oxen; for although they were not deſigned for labour, yet a valuable treaſure may be acquired from a proper uſe of their milk, a liquid formed by Almighty Power, without art, for the benefit of thouſands of the human race. Much might be ſaid with reſpect to the choice of cows; and if the following general rules are attended to, much advantage may ariſe from their being reduced to practice. A cow full in fleſh ought not to be preferred to a lean one, for neither of them will anſwer the propoſed end, nor ſhould any regard be had to the colour. The beſt milch cows are thoſe of a midling ſize, neither fat nor lean, with ſhort curled horns, a round carcaſe, and middle ſized udders. All cows ſhould be purchaſed while they are young, for this plain reaſon, that they may be properly nouriſhed for uſe, and that the farmer may have an opportunity of parting with them, if he finds that they will be of no ſervice to him, for in ſuch caſes he will have it in his power to purchaſe others in their room.

With reſpect to ſheep, there is a great difference between them, according to the counties where the breed is cultivated; and that is an eſſential matter to be attended to by every induſtrious farmer. Lincolnſhire produces the largeſt ſheep in England; and ſo much has the breed been valued, that large ſums have been given for the purchaſe of young ones, particularly in the Northern counties. The ſheep in Herefordſhire are rather ſmall, but their wool is fine, and the fleſh delicious, ſo that it is much eſteemed by ſtrangers who viſit that part of England. The ſheep in the midland parts of England are in general large, particularly in the counties of Warwick, Buckingham, Leiceſter, and Northampton; but as they are for the moſt part originally from Lincolnſhire, ſo there is little difference between them except in the ſize. The ſheep fed on Banſted Downs are rather ſmall, but their wool is much eſteemed, and the fleſh the moſt delicious of any in England. They are much the ſame in the Iſle of Wight, and that is the reaſon why the French, in an illicit manner, contrive to carry ſo many of them off.

In the worſt part of England, particularly in Hampſhire, Wiltſhire, Devonſhire, and Somerſetſhire, the ſheep are in many reſpects much different from thoſe in any other counties in England; their ſize is rather middling than large, their bodies round and plump, their legs ſhort but well ſhaped, and the wool is thick and finely curled. In the purchaſe of ſheep the farmer ſhould not wholly depend on the goodneſs of thoſe brought to the common fairs and markets; he ſhould, when his other avocations will permit, travel into thoſe counties where the different breeds are moſt noted, and endeavour to make himſelf acquainted with them. Sheep ſhould never be purchaſed from a county where the paſture is more fertile than that where they are to be placed, for in ſuch caſes they will daily dwindle away into mere ſkeletons. The alteration in food makes a viſible alteration in the animal, and it is owing to this that the cattle brought from Wales and Scotland, thrive ſo well when fed in England.

CHAPTER III.

Of the Improvement of Heath Lands and Marſhes.

IT has been much agitated in political diſputes, whether the waſte lands in this country ſhould be improved, or remain in the ſame ſtate they have during ſeveral centuries. But all that can be ſaid in defence of their laying waſte is, that cottages may have a common right where it is not in their power to pay rent for graſs for their cattle. Specious however, as the argument may appear, yet certain it is, that we are not to be regulated by theory, but by the preſent practice throughout the nation, in conſequence of numerous act of parliament made almoſt every ſeſſions of parliament for incloſing of commons.

That there is much waſte land in this kingdom is a truth generally known; and were ſuch lands properly improved, it would be of great benefit to the community in general. This, however, cannot be done, unleſs the Lords of the Manors grant long leaſes to the tenants, to repay them for their labour and expence.

In the cultivation of heath ground, the firſt thing to be done is to begin with paring and burning; after which the aſhes are to be ſpread in the ſame manner as manure. This being done towards the latter end of September, the ground ſhould be ſoon afterwards ploughed up, and for one ſeaſon ſown with turneps, which will defray the whole expence. When it has been ploughed the ſecond year and oats ſown, it will produce a plentiful crop, and bring conſiderable advantages to the owner.

But as there are different ſorts of ſoils in heath lands, ſo each muſt be cultivated in ſuch a manner as to be attended with the moſt beneficial conſequences to the farmer. The Scotch firs have always thriven beſt in the black, heathy ſoil, and it is well known that theſe ſort of trees are much cultivated in the preſent age. Six hundred and fifty thouſand of theſe firs may be planted at eight feet diſtance, in in one thouſand acres of this land; the expence of which will not exceed three hundred and twenty five pounds, and four hundred pounds more would defray the expence of incloſing the whole with a ſtone wall, or with a ditch and bank planted with quickſet. Allowances however muſt be made for accidents, and therefore ſuppoſing one half of theſe trees ſhould decay, and the other half arrive at a ſtate of perfection, thoſe that flouriſh will amount to three hundred and twenty five thouſand, which at the end of thirty years, allowing no more than two ſhillings and ſixpence for each tree, will produce no leſs a ſum than forty thouſand ſix hundred and twenty five pounds; ſubtract from this the ſum of ſeven hundred and twenty pounds, the original coſt, and there will remain thirty nine thouſand nine hundred pounds bare profit; which being divided, will be one thouſand three hundred and thirty pounds a year to the tenant. To this it may be added, that theſe Scotch firs are of ſuch a nature, that as they take root and continue to flouriſh, the heathy appearance of the earth wears off, and a moſt beautiful green vendure takes place in its room.

Another of the heathy ſoils is that which is dry, and of a blackiſh colour, and ſuch are generally known by the name of Moors. There are many of them in this kingbom, and moſt of them might be converted into woods, and conſequently yield as high a rent as if they were ſown with the richeſt grain. In the intermediate ſpaces little encloſures might be taken off, and turneps ſown on them, after which they would produce a plentiful crop of oats.

Marſh land is another ſubject which claims the attention of farmers in general, becauſe there are but few farms in which ſome is not found, for however diſcouraging it may appear at firſt ſight, yet if undertaken with courage and carried on with perſeverance, the cultivation of it in the end will repay all the labour that has been beſtowed upon it.

The firſt method to be uſed in the improving of marſhy grounds, is to drain the water into ditches; and having thrown up an incloſure, to raiſe mounts of earth about ſix feet diameter and ſix feet diſtance from each other. Theſe mounts ſhould be as near the incloſures as poſſible, and they ſhould be planted with willows. The moſt proper time for raiſing theſe earthen mounts is the ſummer, while the ſeaſon is dry; and when once they are properly ſhaped, a ſtake ſhould be driven into the center, to mark out the proper bounds for the workmen.

There is great care neceſſary in the formation of theſe hills, for the ground in the intermediate ſpaces ſhould be dug about a foot deep; the ſurface ſhould be thrown into the inſide of the cavity, and the mould that remains below thrown above, in order to make a gentle ſlope from the top to the bottom.

When this work has been properly accompliſhed in the ſummer, the mounts or hills will have time to dry before the plantation of the willows takes place, which ſhould always be at or as ſoon after Chriſtmas as poſſible; but in many caſes the plantation may be carried on with ſucceſs till the beginning of May. The ſhoots ſhould be planted about ſixteen or eighteen inches diſtant from each other, and they ſhould be planted eight or nine inches in the ground, otherwiſe they will not take root. The perſon who plants the willows ſhould be extremely careful leſt the bark be injured, and it will be ſufficient that one or two eyes appear above ground.

From the time that the willows are planted till the June following, the incloſures ſhould be properly fenced to keep out the cattle, and the ſhoots ſhould be carefully cropped off, except the principal one in the center. The knife with which this operation is performed, ſhould be as ſmooth and ſharp as poſſible, leſt the bark may be injured; and if the weeds have ſprung up they ſhould be hoed away, and ſo much of the mould turned up as may, in the ſame manner, prevent their growth during the remainder of the ſeaſon.

Experience has convinced all thoſe converſant with the cultivation of marſhy lands, that what is here laid down is ſtrictly conſiſtent with truth, for in five years at moſt, every acre will produce three thouſand poles, which at the loweſt calculation will ſell for more than ten pounds a thouſand; and in the ſixth year, the ſame number will ſell for ſeventeen pounds, in conſequence of their having arrived at a greater degree of perfection; and thus they will every year increaſe in value, while one tree being left on the hill will always produce a new ſtock.

With reſpect to the intermediate ſpaces between the incloſures in marſhy ground, they may be improved to advantage by ſowing them with the ſeed of Timothy graſs, which has been lately imported from North America. It is the nature of this graſs to thrive moſt in wet ſoil; and if ſown in September it appears in December with ſo much ſtrength as if it had laid in the ground ſeveral years. Horſes and black cattle are extremely fond of it, and in many reſpects it is far ſuperior to either lucerne or burnet, both of which have been much extolled in the preſent age. The ſeed ſhould be immediately ſown after the ſpade, and the mould ſhould be rolled over it in a gentle manner. When this proceſs is carried on according to the method here pointed out, the ſeed will take ſuch deep root in the ground, that within a few months after it has been ſown, a waggon may be drawn over it without doing it the leaſt injury.

The black graſs of America, of which the ſeed may be had in any ſhop in London, will anſwer the ſame end; and it is for the moſt part cultivated in the ſame manner, only that it muſt not be ſown before Lady-day, whereas the other may be ſown at Chriſtmas.

CHAPTER IV.

Of the Manner of Cropping and Improving a new Farm.

THE cultivation of new farms ſhould commence as ſoon after Midſummer as poſſible; and leſt any thing ſhould happen to retard the proper operations, all the implements neceſſary ſhould be ready prepared, that the work may go on with the greater probability of ſucceſs. As turneps is one of the moſt neceſſary articles in the improvement of land, the ſoil ſhould be properly examined. A turnridge plough ſhould be firſt uſed, and the furrow muſt be according to the nature of the ſoil. The next thing to be done is to uſe the winged plough, by which the upper ſurface will be pared off, ſo as to remove the green ſward, and this is generally done to the depth of two inches. This being done, the mould ſhould be thrown over the green ſward by the ſwing plough, and thus by the middle of Auguſt, ſixty acres may be ploughed and even ſowed by the labour of one man and two horſes. There is one thing which the farmer muſt attend to with ſpecial care, in the cultivation of a new farm, namely, to provide proper foods for his cattle, and therefore as ſoon as the turnep ſeaſon is over, ſome fields ſhould be ſown with rye, and others with winter vetches. Rye grows extremely quick, ſo that it is generally ready for uſe in the beginning of ſummer, and before it is wholly eaten by the cattle the vetches will likewiſe be ready for uſe. Barley and clover are the beſt ſeeds to be ſown after rye; and if the land made choice of is not a thick clay, the vetches may be ſlitted off, ſo as to make the next crop of turneps thrive to great advantage. About Michaelmas, or as ſoon after as poſſible, the perſon who would cultivate a new farm, ſhould begin ploughing for wheat, and he ſhould continue doing ſo in the ſame manner as has been preſcribed for the culture of turneps, till the middle of November, and in that time ſixty acres may be prepared and ſown, and a good crop expected.

If the land is mellow or ſoſt, the ſeed may be ſown as ſoon as the ploughing is over; but if it is dry and hard it will be proper to wait for a little rain. In the choice of land for the cultivation of wheat or turneps, there ſhould be always a proper depth of earth ſo as to admit of turning the green ſward at leaſt five inches below the ſurface. It ſhould likewiſe be the drieſt of any that is to be met with in the farm, for the rolling of the green ſward with proper ſhowers, will give it as much moiſture as is neceſſary. When the wheat is ſown, the farmer muſt attend carefully to the nature of the ſeaſon, for if the winter is mild he may plough for beans and peaſe with great advantage; but when the froſt ſetts in, and ploughing cannot be carried on, his time ſhould be chiefly ſpent in preparing proper manures, many of which will be found under the ſurface of the earth; ſuch as chalk and marle, thick earth, which being properly mixed with dung, will repay him for his labour.

Induſtry will ſurmount every difficulty; and therefore, when the farmer has diſcovered any of theſe rich manures on his land, he ſhould have them dug up as ſoon as poſſible, and placed in heaps at proper diſtances from each other, ſo as to be ready for uſe when he may want them on any future occaſion. Neceſſary however as this part of his duty is, he muſt not let it engroſs the whole of his attention, for he muſt ſtill attend to the breaking up the ground as often as the weather will permit. This part of the farmer's buſineſs will generally take place in the months of January and February; and as four ploughs will make great diſpatch, there being little other employment for the men and horſes during that time, ſeventy acres for beans and peaſe may be properly cultivated; and if the ſame aſſiduity and diligence is attended to, an equal number of acres may be prepared for oats before the latter end of March; ſo that the farmer will have the whole month of April to cultivate clover and barley, which are both eſſential duties of his profeſſion.

With reſpect to the duty of the farmer between ſeed time and harveſt, it ought to be attended to with the greateſt care; for as ſoon as the ſeed is properly put into the ground, the next thing to be attended to is, to collect all the materials he can for the inriching of his farm. If chalk can be had within a proper diſtance, ſome weeks ſhould be ſpent in bringing it to the new farm; and although this is not the ſeaſon for laying it on, yet it ought to be piled up in heaps, and earth thrown upon it, ſo as to give it a proper moiſture; another thing neceſſary to be attended to in this ſeaſon, is the deſtruction of weeds, which will be ſure to ſpring up in every ſoil whether poor or rich. Such materials as are wanted for the incloſures of the lands ſhould be now carefully collected together, for it is then that horſes can be moſt eaſily ſpared from other neceſſary labours. At the ſame time the new fences ſhould be cropped and weeded, and the earth thrown up ſo as to give the roots freſh moiſture; the corn is to be weeded, and the beans and peaſe to be hoed. Ponds ſhould be made in the corners of the fields for water for the cattle, and beams with other neceſſaries ſhould be fixed up, upon which the corn in ſtraw is to be planted during the winter till it is thraſhed out. Previous to the approach of harveſt, the farmer ſhould have a proper number of hands engaged to cut down the fruits of the earth, for if he lets ſlip that opportunity, he may happen to loſe all that he expected as the reward of his induſtry. Five weeks is in general the time allotted for the harveſt; and it is certain, that except in extraordinary caſes ariſing from unexpected weather, the whole crop may be cut down and carried home in that time. Let us now ſuppoſe the new farm to be ſo far cultivated that the produce is ready to be cut down; then if there are ſixty acres of wheat, it will require ten good hands to reap the whole within the compaſs of twelve days. If there are eighty acres of barley, and ſeventy acres of oats, to cut down and prepare the whole for the barn yard, it will require the labour of four men during the ſpace of twenty four days.

If forty acres of beans, and the ſame number of peaſe, it will be neceſſary that ten men ſhould have fourteen days allowed them for huſking them. Some allowance however muſt be made for rain; but upon a moderate average, two hundred and ninety acres of corn may be cut down by fourteen men within the compaſs of five weeks.

CHAPTER V.

Of improving by Tillage without Manure.

MOST of the writers on the new huſbandry have aſſerted, that there are many ſoils that may be cultivated ſo as to produce a good crop without manure; and although at firſt ſight ſuch an experiment may appear in every reſpect inconſiſtent with reaſon and experience, yet it ought not to be rejected till what has been aſſerted by thoſe authors has been properly conſidered. It has been aſſerted, that as dung only ſerves to ferment the earth, and make it crumble in pieces, ſo the ſame effects may be produced by tillage, only that the latter will require a much longer time to bring it to a ſtate of perfection.

There is no doubt but in ſome caſes this principle will ſtand good, eſpecially in farms which have been already cultivated; but with reſpect to uncultivated ones, it will be attended with many difficulties. The induſtrious farmer, however, who endeavours to promote his own intereſt by cultivating his grounds in a proper manner, will be continually trying new experiments, till ſuch time as his labour has been attended with the deſired effect.

An eminent farmer who had ſtudied the whole art of huſbandry, and acquired a conſiderable fortune, during his leiſure hours made uſe of the following experiment, in order to diſcover how far land may be cultivated, without the aſſiſtance of ſo much manure as is generally thrown upon it in the preſent age. He cauſed a quantity of virgin earth to be rubbed ſo ſmall as to paſs through a ſieve, and then divided the whole into three equal parcels, which he mixed with a quantity of dung, in weight about one fifth of the whole. The virgin earth was divided into three parts, two of fifteen pounds each,

and

and to each of which were added three pounds of dung, and the third pot contained eighteen pounds of virgin earth, without any earth added to it.

The diameter of the pots into which the earth and manure were put was twelve inches, and five grains of wheat were planted in them in the following manner; there were two inches between each gain, and the root was one inch and an half below the ſurface of the earth. This was done in the beginning of October, and the pots were placed at leaſt one foot diſtant from each other, on a level ſpot in the gentleman's garden.

The ſubſequent winter was moderate, which gave the gentleman an opportunity of obſerving from time to time the progreſs of the ſeeds, for which there was the following neceſſity. One of the pots had three pounds of ſtable dung added to fifteen pounds of virgin earth; and in another pot, to the ſame quantity of matter was added three pounds of rotten dung, which had been covered up at leaſt one year, whereas the third had only eighteen pound of virgin earth, without any dung whatever. He ſoon diſcovered that the grains ſet in the pot impregnated with the freſh dung, looked more green and more high than the others, but they drooped before the ſpring approached, and in autumn they were good for nothing. Thoſe that were planted in the pot impregnated with rotten dung, proſpered much better than thoſe who had the aſſiſtance of the freſh, but neither of them were ſo vigorous as thoſe which had been planted in the mother earth. The enſuing ſummer was extremely hot, and the birds deſtroyed great part of the grains, but when the whole were ripe the produce was as follows: from the five grains in the virgin earth, without dung, fifty-ſix ſtalks; from the ſame number, planted in the rotten dung, thirty-five; but from thoſe planted in the ſtable dung, only twenty, and they much weaker than any of the others. Thus we find, that virgin earth, if properly cultivated, will produce a crop equal to thoſe lands which have been impregnated by the richeſt manure; but then a great difficulty will always attend the choice of the earth, it being well known to every perſon acquainted with agriculture, that what produces a plentiful crop on one ſoil, will create barrenneſs on another; and therefore it is neceſſary that the farmer ſhould be continually trying new experiments according to the nature of every ſoil he finds upon his lands.

It is neceſſary to obſerve in this place, that when we recommend the cultivation of land without manure, it is only addreſſed to thoſe farmers who live in ſuch parts of the kingdom where dung cannot readily be found; and it is certain, that in Scotland, in Ireland, in Wales, and in many other parts of Europe, the country people have no other means to make uſe of towards cultivating their lands beſides that of turning up the earth by the plough. In ſuch places, where many ſheep are bred, it is common to throw up a wall to keep them in the nights during the ſummer, and their dung contributes towards fallowing the earth, which is ſure to be ploughed up the next year. The wall by which the incloſure is made, is compoſed of turf or ſods, which are eaſily dug up, and even the women and children aſſiſt in placing them in proper order; and being expoſed to the heat during the ſummer, and the enſuing winter, it naturally falls in pieces before the plough, and contributes much towards enriching the ground. As theſe folds or incloſures are generally in the midſt of barren fields, ſo when grain is ſown in them, and the ſummer approaches, they appear in the moſt lively manner, as entirely covered with green verdure, and they generally remain fertile at leaſt four years afterwards.

Some farmers, in order to increaſe their crops, have ſteeped the grain in a mixture of lime, nitre and pigeons dung; but this experiment is very precarious, and indeed were it ever ſo beneficial in its conſequences, it is not in the power of every farmer to procure it, nor would it be conſiſtent with the duty and intereſt of a farmer to practiſe ſuch experiments as are only proper for chymiſts. Upon the whole, it is evident from reaſon and experience, that wherever manure or dung can be had, it ought to be uſed; but where that opportunity is wanting, many ſorts of ſoils may be cultivated to the beſt advantage, if patience and induſtry go hand in hand together. The farmers in the remote parts of the country, will reap conſiderable advantages from trying ſuch experiments as will make at leaſt ſome amends for the want of manure; and by proper care and attention, they will at laſt find that their labour has not been beſtowed in vain.

CHAPTER VI.

Of Flax and Hemp.

THERE are few perſons in this kingdom who have any knowledge of our Manufactures, and at the ſame time are ignorant of the vaſt importance of flax to a country whoſe riches depends on commerce, and its ſafety on keeping a navy on a proper and reſpectable footing. Great ſums are annually drained from England to procure thoſe neceſſary articles, and yet experience has convinced many ſenſible perſons, that ſuch flax and hemp as has been cultivated in this country, is far ſuperior to any imported from abroad. It is true, there is one objection which has been generally made, namely, that in this country our rivers are, for the moſt part, ſo cloſed up, that water cannot be eaſily procured; whereas in Ruſſia, and other places abroad, all the rivers are open, ſo that the grounds planted with flax and hemp can be eaſily watered, and conſequently improved to the greateſt advantage; but where every thing is properly atended to, it will be found that the objection has no weight.

The earth upon which flax ſeed is ſown, ſhould be fine and crumbly, with a conſiderable ſhare of moiſture; and if the land has been newly broken up, the crop will thrive exceedingly, as it has lately done in many parts of Scotland, where proper encouragement has been given to thoſe who would be at the trouble of cultivating it. When the farmer has found a ſoil equal to the above deſcription, his next buſineſs is to make choice of the beſt ſeed, for upon that much of his profits will always depend. The flax ſeed imported from Ruſſia has been found to thrive beſt in Ireland, and the Dutch ſeed in Britain; but that ought to be preferred which is heavieſt, of a brightiſh colour, and when bruized appears of a pale green, with an oily ſubſtance, and has a ſweetiſh taſte. The time of ſowing ſhould be from the beginning of March to the middle of April, and three buſhels of Dutch ſeed will be ſufficient for one acre. Great care is neceſſary in the weeding, which ſhould be done when the ſtalks are about five inches high; and as flax is very tender, the weeders ſhould put off their ſhoes before they enter into the field, leſt they cruſh the roots, and ſo prevent the growth. It is common in ſome places to turn in ſheep among the flax; but although their lying upon it and eating the weeds, may prove of conſiderable ſervice, yet their treading upon the ſtalks may do conſiderable injury.

If the flax is tall and ſlender, it ſhould be pulled without any regard to the ſeed, and the moſt proper time is juſt after the bloom has fallen. It is otherwiſe when it is ſhort and branchy, for then it ſhould not be pulled till the ſeed is ripe, becauſe that will be the moſt valuable part, as it will ſerve towards producing the crop the next year. Such of the flax as falls to the ground, ſhould be immediately pulled, for if that is neglected, it will rot, and ſo become totally uſeleſs, and the farmer diſappointed in all the hopes he had formed of receiving advantages from it. It will ſometimes happen that one part of a field will be ripe before another, and in ſuch caſes that which is ripe ſhould be pulled while the others are left ſtanding. It is neceſſary that the pullers ſhould croſs the ſtalks in their hands, becauſe that admits the freſh air; and that which is deſigned for ſeed, ſhould be put up in ſhocks like wheat, and afterwards ſtacked, that it may be properly dried. If the lint only is wanted, then the flax ſhould be ſteeped before the natural moiſture is exhauſted. The water uſed for this purpoſe ſhould be ſoft, and it ſhould lay in the ſtream, expoſed to the rays of the ſun, about four or five weeks, in which time great numbers of inſects will gender in it.

Before the flax is put into the water it ſhould be ſlackly tied up in ſmall ſheaves, and put into the canals with the crop ends downwards, and the roots inclining in a ſloping direction to one ſide of the bank; when it has remained a proper time in the water, which will be known by pulling out a few ſtalks, then the whole ſhould be taken out and cleanſed from all the filth and ſlime which has adhered to it; when the whole is taken out, the canal ſhould be cleanſed, and freſh water put in, after which it may be again filled with flax of a later crop than the former; but the ſame water ſhould never be uſed twice, otherwiſe the flax will be damaged, and rendered unfit for uſe. The coarſe ſhould be ſeparated from the fine before it is put into the water, becauſe that which is fine is much later in coming to a ſtate of perfection than the coarſe. When the flax has been taken out of the water, and cleanſed from every impurity, it muſt be ſpread out upon the graſs to dry; and in moſt caſes the ſhort heath is the beſt, becauſe it faſtens to it, and conſequently is preſerved from being driven about by the wind; it likewiſe admits of a more free circulation of air, and the ſtalks ſhould be ſpread at a conſiderable diſtance from each other; and when properly dried, it ſhould be taken home to a barn, where it is to be kept till it can be diſpoſed of, an opportunity for which will ſeldom be found wanting in ſuch a trading nation as England.

With reſpect to hemp, one of the moſt uſeful articles for the royal navy, it is certain that proper encouragement has never yet been given for the cultivation of it in this nation; and yet it has been found, from repeated experiments, that there is not a nation in Europe in which it will thrive better than in ours. In the cultivation of hemp the firſt thing to be attended to is the ſoil, and that in which it will thrive beſt is fat, rich, black-moulded ſand, becauſe ſuch ſoils are ſeldom peſtered with weeds. There is no neceſſity for dung in the cultivation of hemp, for if the ſoil is deep and ſoft, ſo as to be eaſily penetrated, there will be great reaſon to hope for ſucceſs. In the choice of hemp ſeed, that is beſt which has a gloſſy appearance, and when broken diſcovers that there is an oily ſubſtance in the interior parts; but as there is oftentimes a mixture in that which is ſold in the ſhops, ſo the one ſhould be carefully ſeparated from the other.

The ſeaſon for ſowing hemp is the month of April; and it is very remarkable, that weeds ſeldom ſpring up where it is ſown. Four buſhels may be ſown upon one acre, and it may be trodden upon till it begins to ſpring up, after which it muſt not be injured.

If the ſeaſon is dry, then the hemp ſhould be watered from time to time, and that is the reaſon why thoſe who are beſt acquainted with its cultivation, make choice of ſuch grounds as are near to rivers, lakes, or canals. About the middle of Auguſt the hemp begins to drop its leaves and turn pale, which is an infallible indication of its ripeneſs, and then it becomes neceſſary to pull it. The whole proceſs relating to the hemp is nearly the ſame with that of flax; but as there are two ſorts of hemp, namely the male and female, ſo they ought to be differently attended to. That which is called the male hemp is by far much ſtronger than the female, and arrives ſooner at a ſtate of perfection; whereas the ſeaſon is generally far advanced before the female hemp has ſo ripened that the ſeeds for the next year's growth can be taken out with ſafety. The bundles of hemp ſhould be made much larger than thoſe of flax; and when they have been properly ſteeped in the water, they may be dried upon hurdles, under which a ſlow fire is to be lighted and kept burning till they are dried. In ſuch caſes the hemp muſt be frequently turned, ſo that the watery particles may be gradually exhauſted, after which it muſt be put up in ſtacks at leaſt two months, when it is to be threſhed out, and then the farmer is to ſell it to the manufacturer to the beſt advantage.

CHAPTER VII.

Of Sheep Walks on a new Farm.

THE folding ſheep muſt always be practiſed where the farms are ſmall, becauſe they will not have an opportunity of ranging at large, unleſs there be a fine common in the neighbourhood; and it is well known that many of the commons are now encloſed, The ground made choice of for the folding of ſheep ſhould be dry and ſmooth, with ſhort graſs growing upon it; for if it is wet, the ſheep will be in great danger of being very much injured; nor muſt they be folded too cloſe, eſpecially when the weather is hot. The fold ſhould have always an open field adjoining to it, for the following reaſons, namely, that when the ſeaſon is very wet, or the weather extremely hot, they may have an opportunity of going out to range at large, and therefore the ſhepherd ſhould in all ſuch ſeaſons leave the fold open during the nights. Hurdles ſhould be placed near the ſides of the incloſure or fold, for if the weather is cold, the ſheep will take ſhelter under them; or if they do not, then they muſt be driven to it; but if the weather is hot, they will diſperſe and ſhift for themſelves. It is a common practice with many farmers who have large flocks of breeding ewes, to keep them in fold during the whole year; but this ſhews great want of knowledge, for ſheep chuſe to range at large, both for freſh air and wholeſome graſs, nor do they ever deſire to be encloſed till evening, at which time it ſeems natural to them, unleſs it be ſuch as range from one place to another in numerous flocks.

During the inclemency of the winter, cribs ſhould be made, in which the ſheep may take ſhelter; but where theſe cannot be procured without a great expence, then it will be neceſſary to drive them to the leeward of ſome incloſure, bank, hedge, or wall, if they are not at that time in the fold; for if they are, they will naturally take ſhelter themſelves, without being driven to it. However, notwithſtanding all theſe precautions, yet if the winter happens to be more than ordinarily cold, and much ſnow falls, then the ſheep muſt be houſed, otherwiſe they will be in great danger of periſhing.

Sheep are tender animals, and therefore it is the duty of farmers to ſow broom on little ſlips of ground near the bounds of their incloſures, for that will ſoon grow up, and ſerve the ſheep for a ſhelter in the wet ſeaſon. Furze will anſwer the ſame end; but the ground upon which theſe ſeeds are ſown ſhould be extremely dry, for nothing of a wet or watery nature will ever agree with ſheep.

Some perſons have fooliſhly imagined, that the fleſh of ſheep becomes more delicate by their feeding on wild thyme, or other aromatic herbs; but this is a vulgar error, nor is it conſiſtent with nature, for ſheep will not touch any of thoſe herbs, even if they happen to meet with them, while they can procure one mouthful of freſh graſs. It is hunger alone which induces the ſheep to eat thoſe aromatic herbs; but natural graſs, and indeed that which is ſhorteſt, is what ſheep will naturally feed beſt on, and their fleſh will be more delicious than that of thoſe who have been fed on the richeſt paſtures, as appears from daily experience.

When a new farm is made choice of, and one part of it is deſigned for breeding ſheep, the farmer ſhould be extremely cautious in not ſetting apart for that purpoſe any part of it which is damp, for it ſhould be dry; and if there is none of that ſort of ground on his farm, then he ought not to bring up any ſheep, leſt he injure himſelf without receiving any benefit from his experince and labour. There is much caution neceſſary to be obſerved in the purchaſing of ſheep for ſtocking a new farm, or at leaſt that part of it which is appropriated for their reception. The ewes which lamb early in the ſpring are much preferable to any other; for thoſe who lamb in winter are in great danger of periſhing through the inclemency of the ſeaſon, and their lambs can only be reared with great difficulty.

If theſe rules are attended to by the perſon who takes a new farm, he will find himſelf much enriched; for if the ground will anſwer the purpoſe, no creature will bring him more profit than ſheep, who are uſeful for a thouſand valuable purpoſes, and one of the greateſt articles of commerce in this nation.

CHAPTER VIII.

Of Servants neceſſary for a new Farm, and the neceſſary Implements.

THERE is ſo much depends upon the induſtry and fidelity of ſervants, that too much care cannot be had in the choice of them; and although it is moſt common to hire ſervants towards the latter end of harveſt, namely, about Michaelmas, when many of them are in want of places, yet that ſhould not be conſidered as a general rule, for if the farmer will give his ſervants proper wages, and treat them with humanity, he may be ſure of procuring good ones at any time.

When the farmer intends to make choice of ſervants, he ſhould firſt make himſelf well acquainted with the nature of the work which he deſigns to employ them in; if he does ſo, he will be able to propoſe to them ſuch queſtions which, by their anſwers, will enable him to form a proper judgment of their merit. If the farmer intends to cultivate his ground conſiſtent with the practice in ſome particular counties, then it will be much for his intereſt to make choice of ſervants who have lived in thoſe counties, for it is natural to ſuppoſe that ſuch perſons ſhould be much better acquainted with that ſort of huſbandry than any other; but when it is neceſſary to change the method of cultivating the farm, then it will be equally neceſſary to change the ſervants, unleſs they are ſuch as are acquainted with the nature of huſbandry in general; for ſuch perſons, if of a tractable diſpoſition, will ſoon make themſelves maſters of any thing in the way of their profeſſion.

With reſpect to ploughmen, thoſe who have travelled over ſeveral different counties, are in general much better acquainted with huſbandry than ſuch as have ſpent moſt of their time at home; for it is experience that muſt improve the huſbandman in knowledge, and there is but little difficulty in finding ſuch ploughmen, eſpecially near London, or any other great cities, becauſe they generally go to ſuch places in ſearch of new maſters. If they are men who have acquired a conſiderable ſhare of knowledge, they will generally be found extremely vain, and ſo fond of their own abilities, that they will be ready to look down with contempt on all others, although they may happen to know much more than themſelves. It will be neceſſary, therefore, beſides enquiring into their general characters, to propoſe ſuch queſtions to them, concerning their cultivation of the land where they were laſt employed, as will lead to a knowledge of their abilities; or if they are hired near the ſpot where they formerly reſided, then their workmanſhip may be enquired into. If the farmer is perfectly acquainted with his buſineſs, ſo as to be able to give proper directions to his ſervants in general, he will find it much to his advantage to take into his ſervice as many young, ſtout, induſtrious lads as he may have occaſion for, becauſe he will by theſe means have an opportunity of bringing them up under his own direction, and making them acquainted with every part of huſbandry.

In the choice of a ſhepherd he muſt be extremely careful, nor ſhould one be employed who has not lived in that ſtation before; but he muſt not truſt too much to his management, for, as the old proverb ſays, *A maſter's eye makes a fat horſe*, ſo the farmer who would acquire riches, and ſupport his family in reputation, muſt be as often as poſſible enquiring into the conduct of his ſervants, ſo as to be convinced whether or not they have diſcharged their duty with fidelity. A ſhepherd ſhould have ſome knowledge of the diſeaſes peculiar to ſheep, otherwiſe many of thoſe uſeful animals may be loſt for want of ſkill in the perſon who is appointed to take care of them.

With reſpect to threſhers, they are generally hired for a particular time; and it is expected that thoſe who are expert in their buſineſs will threſh, clean, and prepare for the market, twenty-four buſhels of weat in one week; but this muſt not be conſidered as a general rule, becauſe different circumſtances may take place; but if the farmer does his duty in attending to the conduct of his ſervants, and theſe ſervants are honeſt men, then he need never be afraid but his buſineſs will be conducted in a proper manner.

Women ſervants ſhould never be hired from gentlemen's houſes, for ſuch will never, unleſs forced by neceſſity, ſubmit to the common hardſhips which perſons in ſuch a ſtation are ſubject to. Let the farmer, therefore, endeavour as much as he can to hire his women ſervants from places where they have been uſed to laborious employments, for ſuch perſons, inſtead of aſpiring to any thing above their rank, will be contented with their wages, and diſcharge their duty with fidelity.

Before we conclude this chapter, it may not be amiſs, nor foreign to the purpoſe, to take notice of the proper inſtruments neceſſary to be uſed in the cultivation of a new farm, for in the knowledge of theſe much of the farmer's buſineſs depends; indeed, with reſpect to inventions in huſbandry, they have not received that encouragement which their merit juſtly entitles them to; for the trenching plough, which was invented above one hundred years ago, has even in the preſent age been only introduced into few places; nor has the double ſwing plough been ever encouraged in any of the counties in England, except Buckinghamſhire, where the farmers have found it to be of the utmoſt advantage. It is certain, that inſtruments for the uſe of farmers, ſhould not be too numerous, and they ſhould be conſtructed on the moſt ſimple principles, otherwiſe he will not be able to make uſe of them in a proper manner.

There is an inſtrument known by the name of the Margate hoe, which is extremely uſeful for farmers in hoeing beans, peaſe, cabbage, and turnips, and it may be procured at a ſmall expence. Drill ploughs are likewiſe neceſſary for peaſe and horſe beans, and therefore every farmer ſhould have one of them. The winged plough is of all others the beſt for hoeing up the turf or uncultivated ground; and beſides one of them, every farmer ſhould have an inſtrument, called a chaff-cutter. In the choice of theſe inſtruments a few will be neceſſary, nor ſhould the farmer purchaſe any more at one time than he has occaſion for.

CHAPTER IX.

Of the Expence neceſſary to be laid out in the Stocking of a new Farm.

THE expence requiſite for the ſtocking of a new farm is of ſo much importance, that it is the firſt thing the young farmer ought to conſider before he enters upon buſineſs; for if he neglects that, he may lay out his money to a very bad purpoſe, and inſtead of reaping the profits he expected, become in the end a real beggar. The expence, however, muſt be regulated according to the extent, value, and rent of the farm; and therefore ſuppoſing the rent to be paid at two hundred pounds a year, then a proper eſtimate may be formed of any other in proportion, whether they are greater or leſſer. It is not neceſſary that a new farm ſhould be cultivated all at once, for ſuch things require care, and new circumſtances will often take place, by which the farmer will find himſelf under the neceſſity of deviating from the original plan, which, upon the moſt mature deliberation, he has laid down.

We muſt ſuppoſe that the farm, as a new one, conſiſts of no leſs than nine hundred acres of land, which muſt be divided in the following manner: one third muſt be ploughed up as ſoon as poſſible, and a ſecond part muſt be broken up for the next year, but the third part is to remain in the ſame manner in which he found it, at leaſt till ſuch time as the other parts are properly cultivated ſo as to produce a crop equal to his wiſhes. Thus he muſt prepare every neceſſary implement for the cultivation of ſix hundred acres in one year; nor muſt he forget that at leaſt one quarter of the year muſt be allotted for other purpoſes. One hundred and fifty acres of the farm ſhould be ſet apart for graſs land; and if there is no common ſight adjoining to the farm, then the farmer ought to keep only a ſmall number of ſheep.

Oeconomy, or in other words prudence, is the principal thing the farmer ſhould have in view; it ſhould be his conſtant ſtudy, for, as the wiſe man ſays, *The hand of the diligent maketh rich.* His buildings ſhould be conſtructed on the moſt ſimple plan, and every thing not abſolutely neceſſary, ſhould be carefully avoided; and therefore the following articles will anſwer the deſired end to every young farmer who intends to promote his intereſt in the world: and although ſome of them may be rated a ſmall matter under or above the price at which they may be purchaſed, yet that will be found to be of ſuch a trifling nature that few exceptions can be taken to it.

With reſpect to furniture, it will often happen that the farmer may have it in his power to purchaſe ſeveral articles at a much cheaper rate than thoſe who are obliged to have recourſe to the firſt proprietor; but let the circumſtances be whatever they will, the following ſums will be ſufficient both for furniture and every other article:

Houſhold furniture	£ 40	0	0
Twelve horſes, one of whom muſt be for the ſaddle, and three mares for breeding, at ten pounds each	120	0	0
Ten ploughs on different conſtructions, at one pound ten ſhillings each	15	0	0
Harneſs for twelve horſes, three carts with ladders, two narrow wheel waggons, one broad wheel waggon	35	0	0
Stable furniture, barn furniture, two rollers, nine pair of harrows	12	0	0
Hay for 12 horſes, corn for ditto	30	0	0
Dairy furniture	6	0	0
For three hundred ſheep	12	0	0
For three cows	6	0	0
Pickaxes, mattocks, &c.	6	0	0
Brewing utenſils	12	0	0
Three ploughmen for one year, at ſix pounds each, with their victuals and board	18	0	0
Six labourers, at ſeven ſhillings a week each, without board	13	13	0
Three boys, at forty ſhillings a year each, with board	6	0	0

Weeding, mowing, and harveſting	£ 141	0	0
Houſekeeping, with other incidental expences	50	0	0

From this calculation it will appear, that there is a neceſſity for the young farmer's laying out for materials, when he firſt enters upon the farm, in or about five hundred pounds; but as it will be ſome time before he can reap any profits from his labours, ſo he will be under the obligation of having fifteen hundred pounds in his poſſeſſion, that he may not be reduced to any difficulties, but always have ſome ſtock in hand, in order to anſwer every exigency. One half of this expence will be ſufficient for ſtocking a farm of one hundred pounds a year, and ſo in proportion to any other.

THE END.

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